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ADDRESSES AND ORIGINAL ARTICLES

TREATMENT OF THE UNDESCENDED TESTIS

By E. D'ARCY MCCREA, M.Ch. Dub.,
F.R.C.S. Eng. and Irel.
HON. SURGEON TO SALFORD ROYAL HOSPITAL

THE object of this paper is to describe certain methods of orchidopexy which apparently are not so well known as they deserve to be and which, when selected with judgment, meet almost every requirement. Abdominal replacement is included so that the field of treatment may be comprehensive. The results of operative treatment as usually practised are by no means satisfactory.

The undescended testis is one which has been arrested at some point in the normal path of descent to the scrotum. Its treatment is by operation, if we except the use of gonadotropic hormones at present on trial. Before describing details of technique it is advisable to discuss the varying sites of arrest, the incidence of the condition, its effects on the functions of the testis, and the complications to which it predisposes. A knowledge of the effects of mal-descent upon the functions of the testis and of the possible complications which may arise supplies the indications for treatment, and points to the age at which to operate. The site of arrest suggests the method to be employed.

THE UNDESCENDED TESTIS

Site of Arrest.—The sites of arrest as usually described are:

1. Abdominal or supra-inguinal .. (*a*) Lumbar. (*b*) Iliac.
2. Inguinal.
3. Subinguinal .. .. .. (*a*) Pubic. (*b*) Superior scrotal.

The inguinal variety in which the testis lies in the inguinal canal accounts for two-thirds of the cases, and the iliac, a supra-inguinal position, where it lies just within the abdominal ring, for about 12 per cent. The subinguinal organ may undergo spontaneous descent in a certain proportion of patients, and when the testis is in this position the processus vaginalis is often found to have undergone obliteration as in normal descent.

Incidence.—Undescended testis has been variously estimated to occur in about 1 to 3 per cent. of men. The right side is affected in approximately half the patients and the left in a quarter; this leaves the remaining quarter as bilateral, but some writers state the relationship between unilateral and bilateral non-descent to be as 12 to 1. Coley has observed that the frequency with which undescended testes are met with diminishes with advance of age and states that this points to the probability of late natural descent; however, it is generally held that this late descent is a rare event.

Structure and Function.—The following observations have been made by Southam and Cooper on the retained testis in infancy and childhood. First, at birth the testis approaches the normal but the older the child the more apparent are degenerative changes. Secondly, the further descent has progressed the more normal is the structure. As puberty is approached various changes are noted: fibrosis occurs and there is both an apparent and actual disappearance of tubules while the spermatogonia remain quiescent. Vines also notes the appearance of fibrosis about puberty, but states that evidence of spermatogenesis, or at least of activity, is to be found. In later life he finds much fibrosis and no signs of spermatogenesis. It is agreed that after puberty the interstitial cells of the testis and the supporting cells of Sertoli of the tubules are, as a rule, well developed. Spermatogonia may be present, although in diminished numbers, or they may be absent. The modern view of function is that in bilateral cryptorchids there may be a short-lived production of spermatozoa at, and for a few years after, puberty, but that later these disappear. The internal secretion is undoubtedly produced in the great majority of these patients, although in some bilateral cryptorchids a condition of infantilism has been observed, and the testes may be atrophic (Felizet and Branca). The unilateral cryptorchid is normal as regards sexual life and is fertile.

The possible *complications* of the undescended testis are summarised in the schema given below.

The condition may be uncomplicated and remain so, but the processus vaginalis is as a rule, though not invariably, patent so that a state of actual or potential hernia with its possibilities exists. It is said that the undescended testis is never anatomically perfect and a very definite mesentery or mesorchium often unites the testis and epididymis, producing a resemblance to an ovary with its mesosalpinx (Bland-Sutton). Torsion of the spermatic cord, which it is stated never happens with a normal organ, may occur, and Uffreduzzi observed that 60 per cent. of cases of torsion had taken place in patients with undescended testes. Strangulation of an undescended testis suddenly forced by effort into a tight inguinal ring has been observed as one of the rarer complications. Chronic inflammation with the production of surrounding adhesions may be noted and also hydrocele of the processus vaginalis. Gonorrhœal and tuberculous epididymitis are said to occur more readily in these glands, and when occurring the existing anatomical relationships, either close proximity to the peritoneum or an open sac, may permit of general peritoneal infection. The inguinal and subinguinal testes are less mobile than the normally situated gland and so are exposed to repeated minor traumata which, it is presumed, predispose to the inflammatory changes just noted. A number of authorities hold that malignant disease is more liable to develop in the undescended testis particularly when it is in a position exposed to trauma. There does not appear to be sufficient evidence to show that the abdominal testis possesses this susceptibility, although it is a well-established fact in the horse (Hobday). Neurasthenia and psychic disturbances of varying degrees of severity may arise in the adult.

Mal-descent predisposes to—

Hernia | Torsion | Strangulation | Trauma | Tumour | Hydrocele | Inflammation | Neurasthenia

CONSIDERATIONS ARISING BEFORE OPERATION

Four indications for operation may be given: (1) when both testes are undescended, in the hope that sterility may be avoided; (2) when symptoms

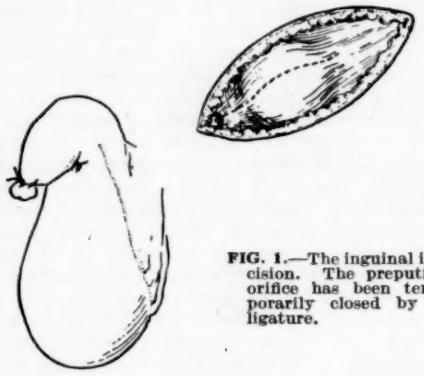

FIG. 1.—The inguinal incision. The preputial orifice has been temporarily closed by a ligature.

are present, most usually either pain or neurasthenia; (3) when a testis is inguinal or subinguinal in situation, and thus exposed to injury; (4) when a hernia coexists.

Age of Operation.—It follows from what has already been said that for functional reasons the bilateral cryptorchid should be operated upon during the third or fourth year, before evidence of developmental failure becomes manifest. This age offers the additional advantage that then the danger of infection is less than earlier. When the deformity is unilateral operation may be carried out at any time after the third year, the earlier ages securing the better functional results.

Late Descent.—The possibility of late descent must be borne in mind when considering the age at which to operate. Descent is comparatively often delayed until after birth, and then most commonly takes place during the first year (Wrisberg); the chances of descent, Coley's figures notwithstanding, may be considered remote after the third year (Southam). The statement that descent often takes place about

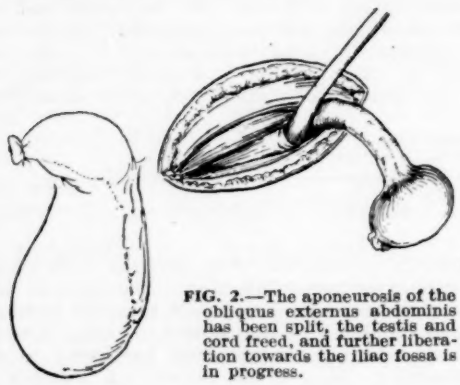

FIG. 2.—The aponeurosis of the obliquus externus abdominis has been split, the testis and cord freed, and further liberation towards the iliac fossa is in progress.

the age of puberty is an opinion frequently expressed though unsupported by figures. Undoubtedly, however, a partially descended testis, particularly if subinguinal, may complete its descent about puberty, and it is in this variety that treatment by gonadotropic hormones (Spence and Scower) should give its best results. Such treatment would precede and might forestall operation: certainly the effects of puberty should not be awaited. Late descent, when it happens, is almost always associated with the development of a hernia and it is as yet unknown whether this is avoided by an induced descent.

Nature of Treatment.—Various forms of extension have been employed in the past for the subinguinal type, but they are all unsatisfactory; nevertheless gentle manipulation is useful in the young infant. It has been stated that if the testis of an infant can be brought down by manipulation, then natural descent will occur in time. Operations designed to place the testis in the scrotum are numerous and this variety of choice indicates that no one method meets every case. For the inguinal testis an alternative to fixation in the scrotum is replacement in the abdomen. Orchidectomy must be condemned and castration in youth forbidden, for the internal secretion must be preserved even if it be impossible to secure spermatogenesis.

The ideal treatment of the bilateral cryptorchid is to place both testes in the scrotum, but this may be an impossibility and then an endeavour should be made to bring one down, the other either being left in, or replaced in, the abdomen. Should scrotal fixation of either prove out of the question then abdominal testes are best left in situ, and inguinal replaced in the abdomen. The unilateral undescended testis, when inguinal or subinguinal, should be fixed in the scrotum, or if this should prove impossible, which is unusual, placed in the abdomen. When abdominal it may, if feasible, be brought down into the scrotum; otherwise it is best left in situ.

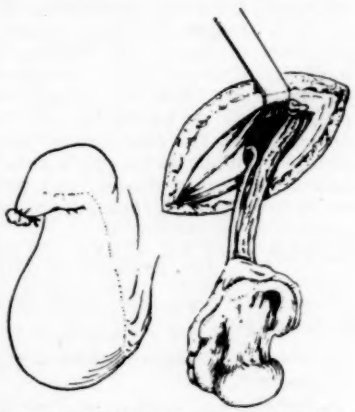

FIG. 3.—The hernial sac has been ligatured and removed. The cord has been freed from all connective tissue and the ductus and vascular pedicle separated and followed up.

It should be remembered that an unsatisfactory scrotal fixation often leaves a fixed and retracted testis which overlies the os pubis, and matters are then worse than before; abdominal replacement therefore is of more practical importance than would theoretically appear.

Choice of Operation.—The ideal is that at the completion of the operation the testis shall lie without tension at the bottom of the scrotum. Bevan's operation and its various modifications may give good results, but only if tension can be avoided. A stereotyped operation for every patient is clearly inadvisable, for in many patients the testis cannot, even when the spermatic vessels are severed, be brought down without tension. This latter procedure is to be denounced, for the artery to the ductus deferens is insufficient for the needs of the testis. In such patients abdominal replacement may be indicated, but not orchidectomy which sometimes has been performed in the past.

Three methods of orchidopexy will be described:

(1) Bevan's operation, which is suitable for the subinguinal testis if it can be brought down without tension.

(2) The modification associated with the names of Walther and Ombrédanne, a most valuable procedure which overcomes moderate tension and counteracts the retraction which is to some degree unavoidable after any of these operations.

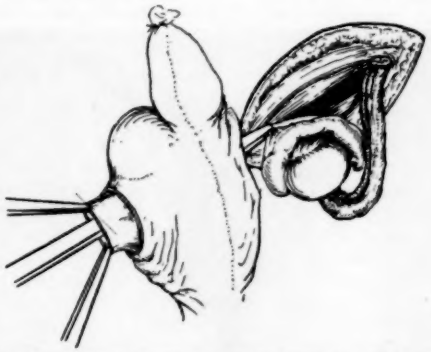

FIG. 4.—Septal transposition; an incision has been made in the opposite side of the scrotum, the right testis having been pushed upwards. The septum has been incised and a forceps passed along the track previously excavated by the finger to grasp the testis.

(3) The operation known by the names of Keetley and Torek. This method is to be preferred when the testis will not fully reach the bottom of the scrotum or only does so under considerable tension.

In addition an account of abdominal replacement is given, for it must be accepted that at times attempts to place the testis in the scrotum are doomed to failure.

TECHNIQUE OF ORCHIDOPEXY

The preliminary exposure and the devices of technique utilised to free the testis and spermatic cord to the greatest possible extent may be regarded as common to all methods of orchidopexy (Figs. 1–3). The first step is the full exposure of the inguinal canal as in Bassini's operation for inguinal hernia. The testis, cord, and processus vaginalis or hernial sac are then freed and lifted from their bed. The second

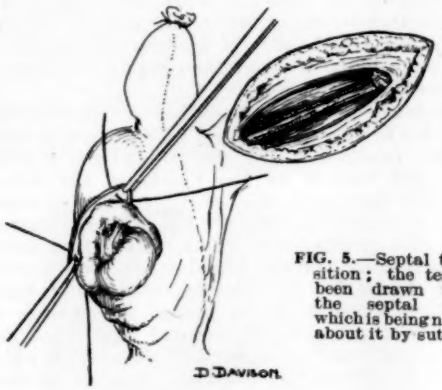

FIG. 5.—Septal transposition; the testis has been drawn through the septal opening which is being narrowed about it by suture.

step consists of the division of the processus vaginalis and the liberation of its proximal portion from the structures of the cord; it is completed by the ligature and removal of this portion as in herniotomy. At the third step the constituents of the cord proximal to the abdominal inguinal ring are separated from each other. The finger or a blunt dissector follows up and frees the ductus deferens and also elevates the peritoneum from the iliac fossa as far up as possible, so that the spermatic vessels which are adherent to it may be brought down. This latter procedure is of the greatest importance.

Fourthly, the spermatic cord is stretched along the thigh and all adhesions, fasciæ, and cremasteric fibres are systematically divided. With care and patience invaluable length is gained. If necessary the dissection is continued until only the ductus deferens and spermatic vessels remain. Additional procedures designed to gain extra length but which are of debatable value are, division of the inferior epigastric vessels with medial displacement of the constituents of the cord, or, these vessels having been freed, transposition of the testis and cord beneath them to their medial side. More useful perhaps is the device noted by Eccles of inversion of the testis by separation of the cauda and corpus

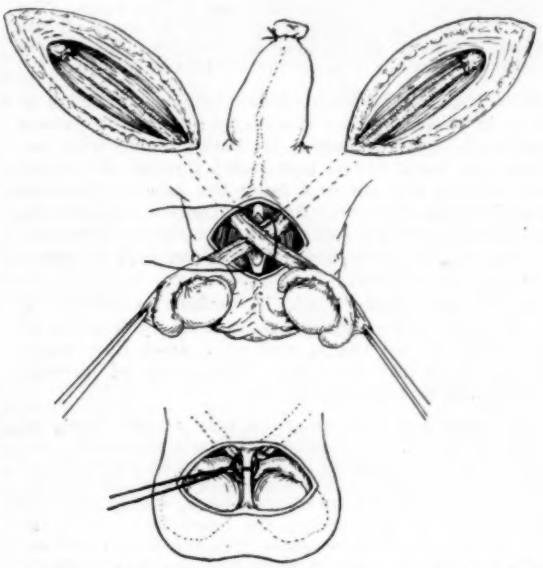

FIG. 6.—Bilateral transposition; the septum has been notched to receive the spermatic cords (Jean and Mouchet).

of the epididymis from the body of the testis, a simple matter with these mal-formed organs.

The remaining steps will vary with the type of fixation adopted.

(*a*) Bevan's method and its modifications. If the testis can be brought to the bottom of the scrotum without tension, it is either left free or fixed there. The latter step may be carried out by a purse-string suture at the base of the scrotum which prevents escape of the testis (Bevan), by suture of the cord to the pillars of the external inguinal ring, or by a suture which passing through the tunica albuginea or remains of the gubernaculum, the scrotum, and the adjacent thigh is tied over rubber tubing. Alternatively to fixation various methods of traction upon a suture passing through the tunica albuginea and emerging from the scrotum are utilised. Burdick and Coley by Bevan's method obtained satisfactory results in only half their patients.

(*b*) Walther and Ombrédanne transplant the testis to the opposite side of the scrotum through an opening in the septum scroti. The testis is retained in that position by permitting the elastic septum to contract about the cord (Turner), or by sutures placed in the septum which draw the latter closely around the

cord. Walther evaginated the opposite testis into the wound in order to incise the septum upon it. Ombrédanne made a second incision over the opposite side of the scrotum to reach the septum (Figs. 4 and 5). The steps of the latter method are as follows:

The testis and cord on the affected side are first of all mobilised and prepared by the methods above described. The opposite testis, if descended, is carefully pushed up into the inguinal region out of danger. The index-finger next forces its way from the wound into the scrotum and towards the opposite side carrying before it the septum. An incision over its tip now exposes the white tissue of the septum into which a small opening is made. The edges of this opening are seized by forceps, and a forceps is passed through the septum following the withdrawing finger to grasp either the remains of the gubernaculum or the ends of a slip-knot suture placed about the cord. A bed is excavated between the skin and septum and the testis drawn through into it. Then the septal opening is narrowed by sutures so as to grasp the spermatic cord lightly and thus prevent the escape of the testis. The cord should move freely, sufficiently so to avoid all risk of strangulation. Should the testis not reach the scrotum readily the septum is displaced upwards to meet it.

When both testes are undescended the operation is done in either one or two stages: with the former one septal opening serves for both glands; with the latter one testis is first transposed through the upper part of the septum and later the second gland is placed below that first fixed. Another single-stage modification which can be understood by reference to Fig. 6 has been devised by Jean and Mouchet and may be utilised.

(*c*) Keetley and Torek in order to obtain a lengthened cord carry out a preliminary fixation of the testis to the thigh, and at a later date place the testis in the scrotum. The steps of Torek's method are as follows (Fig. 7).

The testis and cord are freed and brought down as far as possible in the manner previously described. An oblique incision 1½ inches in length is made on the inner surface of the thigh at a point where the testis will lie without tension; it passes from above, downwards and inwards, and is deepened to the fascia lata. A sac is now excavated in the scrotum with the finger, and an incision 1½ inches in length made into this space through the infero-lateral aspect of the scrotum. The posterior edge of the scrotal wound is accurately sutured with catgut to the superior edge of the thigh wound. The testis is brought down through the scrotum into this wound and fixed to the fascia lata by sutures passing through the tunica albuginea, and then the remaining margins of the scrotal and thigh wounds are sutured together over the testis. The inguinal wound is closed (Fig. 8). The operation is completed at a second stage four to six months or even a year later, at which the scrotum is freed from the thigh, the testis dissected from the fascia lata, and the scrotal skin freed and sutured about the testis.

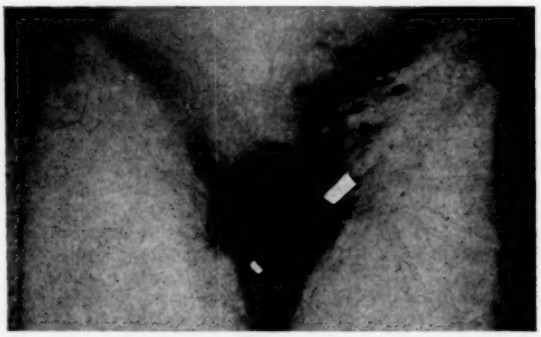

FIG. 8.—Keetley-Torek operation. The first stage has been completed on the left side. Subsequently this patient was given injections of Pregnyl and the right testis, six weeks later, was in the upper scrotum.

Abdominal Replacement.—Should replacement be decided upon after the testis and cord have been investigated and the hernial sac removed, the peritoneum of the iliac fossa is elevated by blunt dissection and a bed made for the testis. It is then placed in this position and fixed by sutures which pass through the tunica albuginea and the fascia covering the iliacus muscle. The inguinal canal is then obliterated by suture.

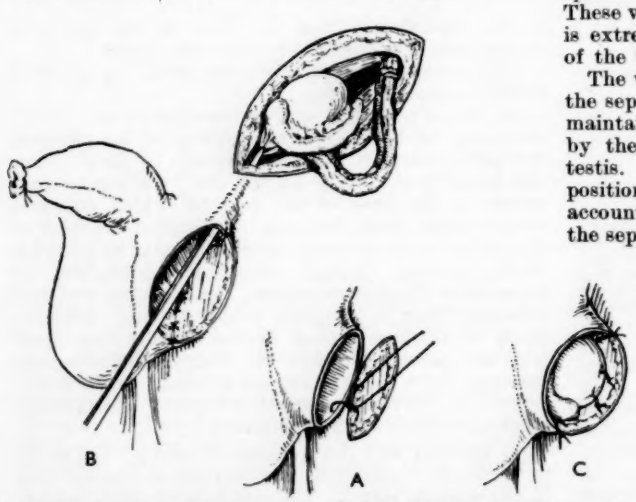

FIG. 7.—Keetley-Torek operation. (A) Incisions in the scrotum and adjacent thigh have been made and suture of the posterior margins has commenced. (B) The testis having been freed is about to be drawn into position. (C) The testis has been fixed in position by suture of the tunica albuginea to the fascia lata. It remains to close the wound.

COMMENTS

The greatest obstacle met with in attempting to obtain sufficient length of spermatic cord to reach the bottom of the scrotum is the shortness of the spermatic vessels, never that of the ductus deferens. These vessels should not be divided for their severance is extremely liable to result in atrophy or gangrene of the testis (Mixter).

The value of the operation of transposition through the septum lies in the elasticity of the septum which maintains constant gentle traction which is aided by the pull exerted by the weight of the second testis. The development of this operation of transposition is of interest. In 1899 Villemin published an account of a procedure by which, after button-holing the septum scroti, the undescended testis was sutured to its fellow. The septal opening made was too small to permit the passage of either testis but allowed apposition and the introduction of the silk sutures which united the glands. Walther, in his method, brought the undescended testis through the septal opening which he closed about the cord, omitting any attempt to unite the two testes. His first publication was in 1903 and he described his procedure more fully in 1906. A variant of Villemin's method was devised and first published in 1902 by Mauclaire; in this operation, the scrotal septum having been divided widely, the tunica albuginea

of each testis was incised and the cut edges sutured so as to obtain synorchidism. The septum was ignored and in fact destroyed by this technique. Witzel in 1905 described a method which combined synorchidism, transposition, and closure of the septum. Finally Ombrédanne (1910) and Turner (1914) modified Walther's technique by incising the opposite side of the scrotum in order to reach the septum more satisfactorily.

Keetley's operation was published in 1894 and Torek's in 1909. It is claimed for the Keetley-Torek operation that at the second stage there is no tendency for the testis to retract. The operations of De Beule (1905) and Gelpke (1905) were very similar and they utilised special exercises in the interval between the stages designed so as to extend the spermatic cord. For bilaterally undescended testes the Keetley-Torek procedure may be necessary on the one side to be followed by transposition on the other, and the former method is always capable of modification from a one-stage to a multiple-stage operation if circumstances require this.

In all methods it is usual to close the inguinal canal after the fashion of the modified Bassini hernioplasty in which the cord is not transplanted, but buried beneath the falx inguinalis, for thus a slight loss of length is avoided.

It may be that in the future treatment by gonadotropic hormones will obviate the necessity for operation in a certain number of these patients, but it is unlikely that the undescended testis will be able to dispense with surgical aid entirely.

Results of Orchidopexy (Figs. 9, 10, and 11).—(1) Using Bevan's operation and its modifications Burdick and Coley obtained satisfactory results in only half of a large series of patients. They now advocate the Torek operation. (2) Using septal transposition Walther reported 7 cases all with excellent results, and Ombrédanne 25 with entirely satisfactory results. In 35 of Turner's series of 50 patients the testis remained well down in the scrotum, whilst in 43 it was in the scrotum. (3) With the Keetley-Torek operation Paschen obtained successful results in 70 per cent. of patients, and Meyer recorded 35 operations all of which were satisfactory.

FIG. 11.—Result of a Keetley-Torek operation.

I have operated upon 21 patients during the past four years and in all of them the testes have remained in the scrotum, though in one case, with bilateral maldescent, the condition is not entirely satisfactory, since the testes which unfortunately are atrophic lie in the upper scrotum; in this patient the technique of Jean and Mouchet was followed. Of these 21 cases 18 were treated by septal transposition but in 3 the Keetley-Torek operation was necessary.

FIGS. 9 and 10.—Results of septal transposition. Note the alteration of the scrotal folds.

CONCLUSIONS

Transposition through the scrotal septum is recommended as the routine operation for mal-descent of the testis. If it should prove impracticable the two-stage Keetley-Torek operation is advised. The latter may be modified so that the necessity for abdominal replacement becomes very rare.

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THE NEUROTROPIC VIRUS DISEASES*

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II.

My second lecture will begin with a consideration of the problems of therapy in the neurotropic virus diseases I dealt with last week. I can summarily dismiss drugs and most other forms of non-specific treatment by the statement that they are quite useless. By this I do not mean to belittle the value of electricity and massage in maintaining the tone of muscles, the nervous control over which will ultimately be restored in a case of poliomyelitis; mere splinting carried out when the muscles are first paralysed can make an enormous difference to the final condition of the patient by preventing deformity due to the continuous unopposed action of unaffected muscle groups. But no drug or mechanical treatment can restore a nerve-cell dead as the result of infection with a virus; and we know of no drug which can influence, to the advantage of the cell, the course of the struggle between cell and virus. Though in some cases the patient may be fortunate in having a sufficient number of essential nerve-cells remaining, which may be trained to compensate for those destroyed, or in having the injury confined to nerve-cells, the loss of which is of less apparent consequence, the ideal treatment must aim at preventing that loss of nerve-cells. The fact that literally scores of drugs have been recommended for the treatment of encephalitis lethargica shows that at the most they act by masking the symptoms due to the nerve-cell destruction and do not effect a real cure. I should mention, however, that repeated lumbar puncture in cases where the spinal fluid is under pressure, as it is usually in the early stages of these infections, is of definite value in minimising the effects of increased pressure on the already injured neurons.

Our hope for the future lies then in the development of some specific form of therapy which will prevent the destruction of the nerve-cells. Specific therapeutic measures can be divided into two categories, those which seek to confer a temporary immunity by the administration of antiserum, and those attempting to immunise the patient more or less permanently by means of vaccination. I shall consider both of these measures.

Treatment with Serum

First of all, the question of treatment by antiserum. This has the advantage of ready availability, and its maximum effects are quickly obtained. But is such treatment of avail in virus diseases? In deciding this question we must neglect neither the underlying principles involved, as established by animal experiment, nor the results of critical clinicians who have had sufficient experience to speak authoritatively on the subject. The viruses we believe to be intracellular parasites, growing in and working their mischief in cells. Now the cell is protected from outside influences by a semi-permeable membrane, and we have no evidence that the complex molecules constituting antibodies can penetrate this barrier. On the contrary, we have much experimental evidence that once a cell is infected antibodies cannot influence the course of events. I may refer to a typical experiment in illustration. If antivaccinal serum be inoculated intracutaneously into a given area, and 5 minutes to 24 hours later many times the minimal infective dose of vaccinia virus into the same area, no lesion results. The serum is able to protect the cells against the virus. If the serum be mixed with the virus *in vitro* and the mixture inoculated, no lesion results. If, however, virus be inoculated into the skin first, and as little as five minutes afterwards serum, the resulting vaccinal lesions are almost uninfluenced in size and severity.[11] The result is the more striking because in this experiment the antiserum can be applied directly and in its full potency to the infected spot. In the case of a nervous disease like poliomyelitis antiserum administered is unavoidably diluted by the body fluids.

Further, in dealing with the nervous system we have another difficulty with which to contend—namely, the hæmato-encephalic or blood-brain barrier, which under normal conditions effectively holds back circulating antibodies. It is true that this barrier is easily broken down by even slight pathological processes. In inflammatory states of the nervous system, including the neurotropic virus diseases, the efficiency of the barrier is probably always impaired, but by this time the damage to the nerve-cells that we seek to avoid has already been inflicted. Even in the case of antiserum inoculated intrathecally there is no evidence that antibodies can penetrate the subjacent nervous tissues where they are needed.

An American authority has stated that once symptoms of any virus disease are manifest, antiserum is not of the slightest value. In the case of poliomyelitis in the monkey one might perhaps go further. Some years ago I infected a dozen monkeys by dropping virus-containing material into the nose, thus imitating as far as was possible the natural mode of infection in man. Four of the animals I kept as controls; to the other eight I administered a very potent antiserum. Two received the antiserum immediately after the intranasal virus and thereafter on alternate days, two received antiserum on the second day and thereafter daily, two received antiserum at the first rise of temperature and thereafter daily, and two received antiserum at the onset of nervous symptoms. All the animals receiving antiserum developed poliomyelitis and died; three only of the four controls did the same. Other observers have since obtained essentially the same results. I have never published these findings and I do not wish to stress them now, for the virus used was an extremely virulent one giving in monkeys a mortality of nearly 100 per cent., so that the test was far more severe than any likely to be set to the clinician. But my gloomy conclusions regarding the value of antiserum in poliomyelitis appear to have been warranted in view of recent observations in human epidemics.

If when a cell is once infected by a virus treatment with antiserum is useless, it is obvious that in poliomyelitis once paralysis is evident, indicating damage to the anterior-horn cells, it is hopeless to expect serum to be of value. This fact is now almost generally accepted. The hope of the advocates of serum therapy is that by giving serum in the preparalytic stages, when the nerve-cells of the upper regions alone are affected, further progress of the disease may be arrested and the case converted into an abortive one. But apparently even this hope has not been realised, and many of the earlier encouraging reports were due to the uncritical manner in which the new measure was tested.

A true impression of the value of a method of treatment can be obtained only by comparing the results of its application to a large series of cases with those in an equally large number of exactly similar cases untreated by the new remedy during

* Abbreviated from the William Withering lectures in the University of Birmingham, 1935. Lect. I. appeared last week.

the same epidemic. Until recently this has never been done. Enthusiastic individuals have treated odd cases, or all their cases in a small epidemic, with serum, and having obtained lower mortality or residual paralysis figures than in a previous epidemic have proclaimed the efficacy of serum therapy. In one report in which reference is made to the lack of controls we read, "to withhold serum treatment for this purpose would be unwarranted in such a disease as poliomyelitis with its far-reaching and permanent disabilities." But how otherwise can we form an estimate of the value of the treatment? It is futile to argue from figures relating to a previous outbreak, for in different epidemics the mortality-rate has varied from under 5 to 40 per cent., and the residual paralysis-rate from less than 50 to 95 per cent. Moreover, these figures are grossly in excess of the reality, since they date from a period when slight and abortive cases were never diagnosed. The early appearance of the patient is no index of the probability of a severe outcome of the infection, and severe preparalytic symptoms are not necessarily followed by paralysis whether serum is given or not.

An investigation into the merits of serum treatment in the preparalytic stages of poliomyelitis, which can be accepted as of statistical value, has rarely been conducted; the outstanding example is that during the 1931 epidemic in New York.[12] A group of more than a thousand cases were diagnosed in the preparalytic stage, and approximately half were given convalescent serum. The remainder received exactly the same treatment except that they did not have serum. The cases were under the care of a number of different physicians, so that the personal element in assessing the results could be largely excluded. The route of administration of serum did not appreciably affect the results. The figures show nothing to indicate the therapeutic value of the serum, either in reducing case-fatality or in preventing paralysis; in fact they show slightly worse results for those given serum. They accord with the previous experience of the comparatively few critical workers, whose voices have been drowned by a vociferous majority advocating the new remedy on the basis of inadequately controlled observations. From them we must conclude that in the preparalytic stage it is already too late to administer anti-poliomyelitis serum with legitimate hopes of a beneficial result.

When we have spent much time and effort in an elaborate investigation, such as the foregoing to determine the value of serum therapy in a neurotropic virus disease, as often as not we later find the answer ready provided in another field. In the present instance nature herself stages the most striking demonstration of the uselessness of serum therapy, in connexion with diseases I gave bare mention last week—namely, equine encephalomyelitis and yellow fever. Introduced into the body by the bite of a blood-sucking insect or by subcutaneous inoculation, the virus of equine encephalomyelitis rapidly appears in the blood where it multiplies considerably. After a time it disappears from the blood, immunity is established, and the animal will tolerate millions of infective doses of virus given subcutaneously or intravenously. But in a proportion of cases, after virus has ceased to circulate and when the animal possesses as potent an antiserum as it ever will possess, symptoms of encephalitis develop and progress to a fatal termination. We can only explain this by assuming that prior to the full acquisition of immunity traces of virus penetrate somehow into the central nervous system, where they are protected from circulating antibodies by the hæmato-encephalic barrier and proceed to multiply unchecked. Further, if an immune animal which has escaped encephalitis be given even a small dose of virus directly into the brain, it often develops encephalitis and dies.[13] If the animal's own fully developed systemic immunity is powerless against virus penetrating the central nervous system, what case can we make out for the therapeutic administration of antiserum in the preparalytic stages of poliomyelitis?

Serum Prophylaxis

The next endeavour must be to determine whether, used as a prophylactic agent before ever the patient or animal is infected, serum may prove of value in preventing contraction of the disease. It is only very recently that this has been attempted in poliomyelitis, but the scanty evidence available is distinctly more encouraging than that of the merits of serum as a therapeutic agent. In Swedish villages during a small epidemic[14] 73 individuals were given convalescent serum and 84 were not. Of the latter, no fewer than 14 developed poliomyelitis, while of the 73 inoculated with serum only one did so. Moreover, this one patient was obviously already infected at the time of inoculation, as he became ill within 40 hours. Recent observations of a similar trend have been made in America. If they are confirmed, at the beginning of an epidemic in future it will be possible by administering serum to children to ensure the promise either of complete immunity or of a very mild attack of the disease.

For the purpose we have available two main sources of serum. Firstly, we may use the serum of patients recovered from the disease. In emergency it is not necessary to seek out a case definitely known to have had poliomyelitis, for, as I mentioned last week, most town-dwellers carry in their serum neutralising antibodies and the pooled sera of normal adults may be employed. Twenty cubic centimetres intramuscularly is recommended as a prophylactic dose, and as its effect does not last more than three weeks it may have to be repeated. Human serum has the very great advantage of giving no reaction, apart from that of the antiseptic, which is in this country usually included in antisera; the patient is not sensitised to future injections.

The second, and frequently more potent, serum is that of animals immunised against the virus.[15] Horse serum is commonly used in this country and America; sheep, baboon, or ape serum in France. Horse serum has the disadvantages over human serum that it often causes reactions and sensitises the patient against its later use in the form of diphtheria antitoxin. Its effect wears off sooner than does that of human serum, so that the dose should be repeated in two weeks' time; on account of its higher content of antibodies it is necessary to give only 10 c.cm. Incidentally this serum has proved highly dangerous when given intrathecally in the treatment of the developed disease, and several fatalities have occurred from its injection by this route; if used for this purpose it should be given only by the intramuscular or intravenous route. Also, if human serum is used for intrathecal inoculation, it is better to do as is done in Australia and handle the blood with strict aseptic precautions, rather than add the customary antiseptic which is certainly more or less irritating to the delicate meninges.

Active Immunisation

So much for the attempts to confer passive immunity. Historically they were preceded by many years by efforts designed to evoke an active immunity—I refer to the classical treatment of rabies.

In brief, the principle of Pasteurian treatment is as follows. By repeated passage of a street rabies virus in the brains of rabbits, the virus becomes much more virulent for that animal. The incubation period of the resultant disease is greatly shortened, and a so-called *virus-fixe* is obtained. In man and many other animals this *virus-fixe* is almost always incapable of producing rabies on subcutaneous inoculation, while conferring immunity to the disease on repeated inoculation. If the injections are begun soon enough after the bite of the rabid animal, in most cases immunity is established during the incubation period of the street virus, and the patient remains well. By such procedure the mortality from rabies, which

amounts to 100 per cent. once symptoms have developed, serum therapy having not the slightest effect, has been enormously diminished. Also in some countries where owing to extensive land frontiers the quarantine imposed on dogs entering Britain is not feasible, routine antirabic inoculation of dogs, cattle, &c., has been of assistance in checking the ravages of the disease.

In the original Pasteur method the earlier injections consisted of rabbit cord attenuated by drying for a period of days; these were followed by injections of cord dried for shorter and shorter periods until finally fresh cord was used. In countries divorced from the Pasteur tradition, various modifications of this treatment have been introduced, and in many places the use of living though attenuated virus has been replaced by that of virus treated by various chemicals, with the intention of killing it in such a manner as not to impair its antigenic properties. I cannot now deal with the question of whether such virus is really completely killed, and of whether dead virus is an effective agent for the purpose of vaccination. All I will say is that carbolised rabies vaccine appears to be perfectly satisfactory as an immunising agent, and that its use is attended by less risk of undesirable complications in the form of the paralytic accidents which I shall mention later.

These beneficial results of antirabic treatment stand out in sharp contrast to those of serum treatment in poliomyelitis.

In many other virus diseases carbolised vaccine is not an effective immunising agent, and a formolised vaccine appears to be preferable; recent work indicates that in poliomyelitis a very considerable degree of immunity may be established in children by employing formolised virus. In still other infections a mixture of virus with immune serum in such proportion that the virus is only just neutralised seems more useful. In the last case, unfortunately, if the serum is in definite excess immunity does not usually result, and if the virus is only just neutralised occasional cases of the disease are apt to occur from administration of the mixture to more than usually susceptible subjects. While, therefore, in the case of an animal disease, an intelligent farmer will willingly exchange the possibility of a 1, 2, or even 5 per cent. mortality from vaccination for that of a 20, 50, or 80 per cent. loss in the next epidemic, the method is not often applicable to man. There is no royal road to success in the choice of a vaccination procedure in the neurotropic virus diseases; the best method in a particular case is always a subject for experiment, and there is an enormous field for advance along these lines.

By comparison with the ephemeral effects of antiserum, the protection afforded by vaccination is relatively long-lived. The chief disadvantage of all methods of producing active immunity is the comparatively long time they require to lead to results. While the long incubation period of rabies permits the adoption of such procedure, in acute diseases such as poliomyelitis it is useless to think of vaccination when the patient or animal is already infected. It must be carried out beforehand in anticipation of the coming epidemic. And this means that in the case of a disease like poliomyelitis, which in this country relatively seldom causes serious epidemics, it is very improbable that public opinion will ever be educated to the point of wholesale vaccination. But looking to the future and speaking quite generally, one would be inclined to forecast that in both human and animal medicine vaccination will ultimately prove of greater value than serum therapy.

Post-infective Encephalitis

There is another type of acute encephalomyelitis to which I must now refer. It is one of which we do not know the ætiology, whether virus or not, and we cannot, therefore, class it as a neurotropic virus disease. But it must be considered here because it usually occurs in association with a virus disease, to which it bears a characteristic and relatively constant temporal relation. The most familiar example in this country is the post-vaccinal encephalitis which aroused so much consternation in public health circles between 1922 and 1930 [16]; its incidence was, perhaps, 1 case in 50,000 vaccinations, but cases were not evenly spread over the different age-periods. It did not follow primary vaccination in infancy, nor to any extent repeated vaccination in later life. Nearly all cases were in individuals vaccinated for the first time in late childhood or adult life. In Holland, where primary vaccination is ordinarily performed when the child reaches school age, cases were far more frequent between the dates mentioned, but other countries insisting on infant vaccination remained relatively free. The same type of encephalitis, pathologically and clinically, has recently occurred as a sequel to small-pox,[17] measles,[18] influenza,[19] and so on, and possibly also as an independent disease. The so-called paralytic accidents occurring in the course of antirabic treatment are in some cases due to this condition, though they are not a homogeneous group of maladies, and some are indubitably cases of rabies arising in spite of treatment; in many instances, however, the fact that symptoms are temporary distinguishes them from true rabies.

Although we now know that occasional post-vaccinal cases occurred before 1922,[20] it was only then that they became comparatively numerous and that the disease was recognised as a definite clinical and pathological entity. On going back into the older literature, however, we find a similar condition appearing not infrequently in the closing decades of the last century, and perhaps again at more remote periods, in sequence to small-pox and measles. The same periodicity is noted in the incidence of paralytic accidents of antirabic treatment; thus at the Vienna clinic between 1894 and 1914, 7632 cases were treated without accident, while between 1915 and 1932 6764 cases showed 39 paralytic accidents. This periodicity of encephalitis complicating the convalescence of various acute fevers is a characteristic which we must take into account when considering its ætiology.

The time relation to the preceding exanthem is interesting. The majority of cases of post-vaccinal encephalitis occur within 10 to 13 days of the date of vaccination—that is, after the period of maximum reaction to the introduction of virus, and when the patients already possess immunity to the initial infection. After other exanthemata roughly the same interval elapses, taking into account the fact that when the eruption appears the patient has already been infected for some time. In the case of antirabic treatment nervous symptoms begin during the second half of the series of prophylactic injections. The severity or otherwise of the initial infection appears to have no influence on the frequency of encephalitic complications of this type. Clinically two groups of cases are recognised, the predominantly encephalitic and the predominantly myelitic; the former are the more numerous except in the case of paralytic accidents which are always myelitic. But in fact the two groups usually overlap at some stage and the distinction is rarely clear-cut.

Often attention is drawn to the onset by observation of a slightly unsteady gait or unnatural somnolence rather than by any complaint on the part of the patient. The temperature which has fallen to a normal or subnormal level following the initial pyrexia of the exanthem now rises again; headache, pain in the back or limbs, vomiting, neck rigidity, and Kernig's sign may be present. Convulsions may occur. Disturbances of sphincter control are almost constantly present. Drowsiness, stupor, or coma is soon

the outstanding feature. The limbs become typically flaccid. Ocular palsies are rare, but papillœdema may be present. This state may in a very few days terminate in death, often from broncho-pneumonia; the mortality in post-vaccinal cases is about 40 per cent., in measles much lower. But a striking feature of the malady is the astonishing recovery of apparently moribund patients who make a rapid, complete, and uneventful recovery.

If the patient recovers, the unconscious state may last for days or occasionally for weeks. With increasing consciousness the character of the nervous lesions becomes apparent, the cerebral changes causing hemiplegia, diplegia, and aphasia; those of the basal ganglia choreiform movements; those in the brain-stem rigidity, tremor, difficulty in speech or in swallowing; those of the cerebellum ataxia; the spinal lesions flaccid paralysis, sensory disturbances, and retention of urine. Trismus is sometimes conspicuous. An emotional phase or alteration of behaviour may follow return to consciousness. All these abnormalities disappear more or less rapidly, usually in weeks rather than in months, and the permanent sequelæ of encephalitis lethargica are strikingly absent.

Pathologically the disease, whatever its clinical form, is stereotyped. It is characterised by a direct attack on the myelin sheaths and by little or no affection of the nerve-cells. It is thus the very antithesis of that produced by the neurotropic viruses to which I have already referred. It is an example of the primarily demyelinating diseases, and probably has much in common with acute disseminated sclerosis, Schilder's disease, and neuroptico-myelitis. Nor is this group of maladies confined to man; a probably allied condition follows distemper in dogs, and one closely resembling Schilder's encephalitis occurs as a spontaneous disease in monkeys.

In the post-vaccinal type of encephalomyelitis the demyelination is seen in three situations; around the veins of the grey and white matter of brain and spinal cord, in a narrow zone beneath the meninges at the periphery of the cord and brain-stem, and in a similar zone beneath the ependyma of the ventricular system. Lesions are roughly symmetrical on the two sides. The destruction of myelin sheaths is accompanied by a vast accumulation of phagocytic microglial cells engaged in removing the products of their breakdown, which in cases of some standing are largely neutral fat. Inflammatory signs of the nature of perivascular infiltration may or may not be prominent; they are not an essential part of the picture. Even when enclosed in an area of severe change the nerve-cells show comparatively little or no injury, and it is to this relative immunity of the neurons to the noxious agent that the very dramatic recoveries are no doubt due. Moreover, in the demyelinated zones there is not always destruction of the axis-cylinders in proportion to the destruction of their medullary sheaths, which fact probably contributes to the recovery of function once the acute phase is past.

Causation of the Demyelinating Disease

We do not know the cause of this condition and theories of its ætiology have multiplied.

The first obvious suggestion was that it is directly due to the virus of the preceding exanthem. On the whole, this is very improbable for a number of reasons. First it occurs, as we have seen, when immunity to the initial disease has already been established. This argument does not carry the weight it did a few years ago before we knew the facts I have summarised concerning the viruses of equine encephalitis and yellow fever. But a second argument is the very varied nature of the predisposing infections; it would be remarkable, though not of course impossible, if vaccination, small-pox, measles, influenza, and antirabic inoculations all produced exactly the same clinical and pathological condition in the nervous system. Even if they did we should still have to account for the periodicity of the disease, and we could do this only by assuming some sudden change in the character of the virus or in the soil in which it is implanted. As one author,[18] writing on post-measles encephalitis, says: "A condition which occurs in so small a proportion of cases of measles, and which in one year may suddenly appear with much greater frequency and cause more deaths than in the previous twenty years, is unlikely to be due to a sudden change in the nature of so common a disease." It is still more improbable that a similar change in pathogenic properties would occur simultaneously in a number of different viruses. In Holland during the course of the outbreak of post-vaccinal encephalitis, Spanish Government vaccine produced by a different procedure from that employed by the Dutch was brought into use. In Spain no post-vaccinal encephalitis had occurred, but in Holland the use of the new vaccine resulted in an increased number of cases of encephalitis. Observations such as this are difficult to reconcile with the belief that some change has taken place in the vaccinia virus or that it is the direct cause of post-vaccinal encephalitis. Moreover, vaccinia and rabies, two of the viruses under suspicion, when infecting the nervous system each evoke lesions quite distinct from those under discussion. Rabies is a typical neurotropic virus such as we have already considered. Vaccinia does not produce nervous lesions in animals unless it is inoculated directly into the brain; then the histological condition is primarily a meningitis.[21] So that if the viruses of vaccinia and rabies are the direct causes of encephalitis following vaccination and antirabic treatment, we must believe that each is capable of producing two different nervous diseases diametrically opposed in their clinical and pathological features and in their prognosis. This is not, I suppose, impossible but then we should expect to be able to recover the virus from the brain at death, which we cannot do. Finally, if, as there is reason to believe, the condition occurs occasionally as an independent malady, it is very difficult to uphold the view that in the post-infective cases the virus of the preceding exanthem is the agent responsible for this type of encephalitis.

Another theory which has but few exponents and which I will mention only for the sake of completeness is that we are dealing with some allergic phenomenon. This would readily account for the appearance of similar pathological pictures in a number of different virus diseases. But on the experimental side it has not been possible to adduce evidence in its favour that is even remotely suggestive, let alone conclusive.

A third view postulates the activation of a virus entirely different from that causing the initial infection, and latent in the patient until aroused into activity by the constitutional disturbance following an acute infection. Following closely upon the heels of the epidemic of encephalitis lethargica, it was suggested that this was latent encephalitis lethargica activated by vaccination or what not. Not only are the clinical courses of the two diseases entirely different, but much other evidence speaks against this view. Not one of the demyelinating diseases, which form as it were a group to themselves among the encephalitides, has ever been shown to be due to a virus or to be transmissible to laboratory animals. While it might well happen that a virus affecting man is pathogenic for no other animal, and failure to reproduce the disease could be accounted for on

this basis, in the case of the similar diseases affecting lower animals this objection would not apply. The demyelinating diseases of the dog and monkey have not yet been transmitted to other animals of the same species. There is, therefore, no evidence whatsoever that the nervous lesions responsible for the post-infective type of encephalitis are due directly to the action of a virus, though they are in the majority of instances associated in a very definite manner with a virus disease.

The whole question of the causation of the demyelinating diseases of the central nervous system is one bristling with unsolved problems. Not only has post-vaccinal encephalitis become a serious problem during the past decade, but most neurologists agree that there has been a simultaneous increase in the number of cases of what are variously termed "acute disseminated encephalomyelitis" and "acute disseminated sclerosis." Probably disseminated sclerosis of classical type is also occurring more frequently than of yore. A few years ago claims were made that a virus had been isolated from cases of disseminated sclerosis, but this work has since been thoroughly disproved. Fundamentally the ætiology of the different demyelinating diseases is probably one problem and not several, but we have at present no inkling of its solution.

In the absence of any accurate knowledge of the causation of post-infective encephalitis we have no logical basis for aught than general treatment. Good results have been recorded from the use of antisera to the primary exanthem. My preceding remarks suggest the difficulty of estimating the chances of recovery in a given case, and sudden unexpected improvement is not necessarily attributable to an antiserum administered. Since the encephalitis begins at a time when the patient has already developed his own immunity to the initial infection, it is difficult to see how a little additional antiserum to that infection can prove of value.

Considering the mildness of the type of small-pox at present prevailing in this country and with the object of preventing the post-vaccinal disease, the Ministry of Health does not now consider it expedient to press for primary vaccination in later childhood and adolescence, except in the case of direct exposure to small-pox. But since an extensive outbreak of severe small-pox is always a possibility, and becomes more and more of a probability as the proportion of adequately protected individuals in the community diminishes, and since vaccination in infancy is not only devoid of risk of the encephalitic complication but also ensures against it in the event of revaccination in later life, it seems that the public welfare would be best served by more vigorous advocacy of vaccination in the first year of life.

Chicken-pox, German Measles, and Mumps

I have so far refrained from mentioning chicken-pox, rubella, and mumps as antecedents of the post-infective type of encephalitis, as in the case of nervous complications of these fevers we are at present not sure of our ground.

The encephalomyelitis complicating varicella agrees with the preceding in that it follows the exanthem after a fairly definite interval. On the other hand, it differs in several important respects. In the first place it is not often fatal, and in consequence autopsies have been rare. On the three occasions on which pathological examination has been possible, the lesions once rather closely resembled those in post-vaccinal encephalitis, while on two others they were different. Clinically, acute cerebellar disorder is a conspicuous feature in a much larger proportion of cases than after vaccination, &c., though meningeal symptoms and symptoms of transverse myelitis are also observed. Since varicella is undoubtedly very closely related to herpes zoster, and the latter is presumably caused by a typical neurotropic virus, it would be wise to suspend judgment on the nature of these sequelæ until further information is available.

Nervous complications of rubella are very rare, but one case apparently identical with the post-vaccinal cases has been described.

Mumps has now been shown conclusively to be due to a filtrable virus,[22] and occasional involvement of the nervous system has been recognised for years. Meningitis with a very marked lymphocytosis in the cerebro-spinal fluid seems to be the most frequent condition, but encephalitis and polyneuritis may occur. It appears that increased lymphocytes in the cerebro-spinal fluid are not uncommon in mumps in the absence of definite meningeal symptoms, so that a silent infection of the central nervous system may be more common than we suspect. A fatal termination is very rare, and at present there is no evidence that the post-vaccinal type of encephalitis is ever a sequel to this infection.

In almost any of the preceding exanthemata as well as in the acute fevers to which no reference has been made, nervous complications of great variety may be more or less infrequent concomitants or sequelæ—toxic encephalitis, pyogenic or tuberculous meningitis, embolic, thrombotic, or uræmic cerebral lesions, all may occur. I have even seen a case of juvenile general paralysis apparently activated and converted by vaccination into a fulminant and rapidly fatal condition, as well as two cases of tuberculous meningitis following vaccination within a short period. But in contra-distinction to the post-vaccinal type of encephalitis, these other complications do not show the relatively uniform symptomatology, the fairly constant "incubation period" after the initial exanthem, the periodic incidence in certain years or decades, or of course the characteristic pathology.

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AMNESIA FOLLOWING HEAD INJURIES*

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AFTER head injuries accompanied by immediate loss of consciousness, certain disturbances of memory are well known to occur. On full recovery of consciousness, the patient is found to have little or no recollection of events during the period of confusion following the injury. It is also well known that when a head injury has caused immediate loss of consciousness, the patient after recovery has no memory of the moment of injury. Further there is permanent amnesia for a short period before the

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injury occurred. In 180 out of 200 cases in which I have inquired—after full recovery of consciousness—into the duration of this retrograde amnesia it has proved to be only a few seconds or minutes, and in only 4 cases was it more than 24 hours, the longest period being 7 days.

In these 200 cases the total period of amnesia following the injury was also estimated after full recovery of consciousness. In 153 cases it was less than 24 hours, in 37 cases it was 1–14 days, and in 10 cases it exceeded two weeks. In one of the latter there was amnesia for eight weeks after the injury. The duration of retrograde amnesia is by no means always proportional to the duration of total amnesia, as I have shown elsewhere, but long periods of retrograde amnesia are more commonly present in cases with long total amnesia.[1]

In drama and fiction head injuries sometimes cause retrograde amnesia extending over many years, but in over 500 cases under my observation I have never known a *permanent* retrograde amnesia cover more than a week before the injury, and it seems probable that cases in which it appears to last for years are really hysterical. On the other hand—and this is the first point I wish to emphasise particularly—a retrograde amnesia of several years' duration may appear to be present before consciousness has fully recovered, because the memory for distant events tends to return before the memory of more recent occurrences. For example, a patient recovering from concussion will often say he is younger than he actually is. The following case is an unusually striking illustration:—

A greenkeeper, aged 22, was thrown from his motor cycle in August, 1933. There was a bruise in the left frontal region and slight bleeding from the left ear, but no fracture was seen on X ray examination. A week after the accident he was able to converse sensibly and the nursing staff considered that he had fully recovered consciousness. When questioned, however, he said that the date was in February, 1924, and that he was a schoolboy. He had no recollection of five years spent in Australia and two years in this country working on a golf course. Two weeks after the injury he remembered the five years spent in Australia, and remembered returning to this country; the past two years were, however, a complete blank as far as his memory was concerned. Three weeks after the injury he returned to the village where he had been working for two years. Everything looked strange, and he had no recollection of ever having been there before. He lost his way on more than one occasion. Still feeling a stranger to the district he returned to work; he was able to do his work satisfactorily, but had difficulty in remembering what he had actually done during the day. About ten weeks after the accident the events of the past two years were gradually recollected, and finally he was able to remember everything up to within a few minutes of the accident.

This case is of course exceptional, but the gradual shortening of the period of retrograde amnesia may often be observed in patients recovering consciousness after head injury. It is noteworthy in the above case that during the period in which there was retrograde amnesia for over two years the memory of very recent events was also impaired. The highest cerebral functions had therefore not yet fully recovered.

FALSE ACCUSATIONS

Another point in the study of cases recovering from concussion is that events which occurred immediately before the injury are occasionally remembered indistinctly during the period of confusion, even though there will be complete amnesia for these events after consciousness has returned in full. This memory may result in the patient making false accusations, as in the following case.

An electrical engineer, aged 38, while riding a motor cycle, swerved suddenly to avoid a dog which ran in front of him. He was brought to hospital on August 8th, 1933, in a stuporose state, and was found to have a fracture of the middle fossa of the skull. There was gross bruising in the left frontal region. When re-examined five months after the accident he reported that he was quite fit and had been working regularly for three months. He said that he had no recollection of events for a period lasting from two days before the accident to two weeks after it. There was not the slightest recollection of the accident itself.

When, however, this patient was examined two days after the accident, he was often heard to say, "It was a dog!" Six days after the accident he was in a confused but very aggressive state and said: "I am supposed to have had a smash, but it wasn't my fault. A dog flew at me and I flew at it. The farmer's son turned on me and smashed with an instrument in his hand. He is getting arrested to-day. The police have found the instrument; everything is turning out as I said, marks on the instrument and everything." The accident was witnessed by several people, and the only connexion the farmer's son had with the accident was that he accompanied the patient to hospital in an ambulance.

This case is similar to one recorded by Somerville[2] in which a doctor motored home a boy who had fallen off his cycle, and was subsequently accused by the boy of having run him down.

Another similar case is that of a porter at a picture gallery who had an accident on July 14th, 1934. He was standing on a tramway island when a motor-van passed the island on the wrong side. Though he described himself as the last person to be easily frightened, he evidently threw up his arms when he saw the car, and by so doing was thrown to the ground. He recovered full consciousness in hospital 12 hours later. During the following two weeks he could remember nothing he had done for a period of about ten minutes before the accident occurred. About two weeks after the accident the retrograde amnesia lessened, and he could then remember standing on the tramway island just before the accident. Four months after the accident the period of retrograde amnesia was unaltered, and he had absolutely no recollection of the accident or of the 12 hours which followed. He informed me, however, that for about a week after his admission to hospital he had on many occasions a sudden vision of the huge tyre of a motor lorry bearing down on him while he threw up his arms unable to escape. These visions only occurred during the week following the accident.

Cases like this are in my experience very uncommon. I hesitate to attempt to offer any explanation, but I hope that their description may be of help to some who are attempting to unravel the mysteries of cerebral mechanisms.

SUMMARY

During recovery from head injuries, memory of distant events usually returns before more recent events can be recollected. During the period of post-concussional confusion the patient occasionally appears to remember events immediately preceding the injury, of which he has no recollection when he later becomes fully conscious. At this time he is liable to make false accusations.

I am greatly indebted to the surgical staff of Edinburgh Royal Infirmary for permission to study cases under their charge, and to the statistical research department under whose auspices much of the work has been done.

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DUODENOCOLIC FISTULA SIMULATING IDIOPATHIC STEATORRHŒA

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THE presence of fatty diarrhœa in certain cases of gastrocolic fistula was emphasised in 1921 by Strauss who recognised the similarity of the fæces in this condition to those occurring in sprue. Since then Fairley (1930), de Rivas (1930), Fairley and Kilner (1931), and Thayssen (1932) have reported cases of gastrocolic fistula which have closely simulated the clinical picture of sprue or of idiopathic steatorrhœa and which have, in several instances, been actually diagnosed as such. The following case of duodenocolic fistula, caused by a carcinoma of the transverse colon, is reported both because of the rarity of the lesion, and because of the close similarity of the clinical picture to that of idiopathic steatorrhœa.

CASE RECORD

FIRST ADMISSION

A waiter, aged 43, attended the out-patient department of Westminster Hospital on Sept. 11th, 1933, complaining of diarrhœa and vomiting. He had felt perfectly well until the onset on Sept. 5th of diarrhœa associated with some abdominal discomfort. This was followed two days later by vomiting which was at first severe. The diarrhœa persisted despite treatment and on Sept. 26th he was admitted to hospital under Dr. David de Souza. There was no previous history of any intestinal disease and he had had no previous attacks of diarrhœa or constipation. He had served in India in 1909 and there had malaria. Apart from this he had always been well.

When first in hospital his temperature was found to rise to 100–102° F. each evening. His stools were observed at that time to be rather pale and semisolid. On examination nothing of note was observed except for an indefinite mass in his right hypochondrium. There was no abdominal tenderness.

Microscopic examination of the stools (Sept. 27th) showed excess of free fatty acids, but no excess of soaps or neutral fats; there was much undigested muscle and vegetable material. Culture revealed lactose-fermenters only. A blood count (Sept. 27th) showed red cells, 4,510,000 per c.mm.; hæmoglobin, 80 per cent.; colour-index, 0·88; mean diameter of red cells (halometer), 7·6 μ; white blood-cells, 9200 per c.mm.; normal differential count. On Sept. 29th the blood calcium was found to be 10·8 mg. per 100 c.cm. On Oct. 4th serum agglutinations to the enteric organisms, to the *Brucella abortus*, and to the Gaertner bacillus all proved negative.

Progress.—The diarrhœa and vomiting gradually abated, the temperature became normal, and the patient's general condition improved. Before any further investigations were carried out he discharged himself on Oct. 24th.

SECOND ADMISSION

He was readmitted to hospital on April 22nd, 1934. His diarrhœa had recurred soon after his discharge and had since persisted unchecked. He complained of occasional vomiting and on questioning admitted that on one occasion his vomit had resembled his stool and that his flatulence had then been fæcal. His general condition had deteriorated considerably; he had lost 18 lb. in weight in six months; he had become pale and recently his legs had become œdematous. He also complained of breathlessness and loss of energy. There had been no abdominal pain or tenesmus and he had at no time noticed any blood in the motions or vomit.

On admission his nutrition was poor and his skin had lost its elasticity. There was profound pallor. Much œdema of the legs and sacral region was present and the anterior abdominal wall was slightly œdematous. His temperature was normal and subsequently never rose above 100° F. The veins in his neck were found to be slightly engorged. His heart was enlarged, the cardiac impulse being just outside the midclavicular line. The heart sounds were healthy. His blood pressure was 110/80 mm. Hg and his pulse-rate varied from 80 to 100 beats per minute. No abnormal physical signs were found in his respiratory or central nervous systems. He was edentulous. His tongue showed no signs of glossitis. The abdomen was distended and considerable ascites was present. The liver edge was just palpable, but the spleen was not felt. There was no tenderness and there was now no palpable mass. His urine was clear and contained no albumin or sugar. He had two to four motions a day and his stools were pale, bulky, porridge-like, and offensive.

SPECIAL INVESTIGATIONS

Barium meal.—April 16th: "There was no X ray evidence of gastric ulcer or neoplasm, and no signs of a gastrocolic fistula. The meal passed normally over the pylorus. There was some delay in the rate of emptying of the jejunum, but no definite obstruction. The meal shot through the colon in 24 hours."

Fæces.—April 23rd: microscopic examination showed the presence of neutral fat and fatty acids with much undigested muscle; no ova, parasites, pus, mucus, or tubercle bacilli were found. April 30th: the total fat formed 92·2 per cent. of the dried fæces and was composed of 31·2 per cent. neutral fat, 60·5 per cent. free fatty acids, and 8·3 per cent. soaps.

Hæmatology.—April 16th: red cells, 3,540,000 per c.mm.; Hb., 68 per cent.; C.I., 0·9; mean diameter of red cells (halometer) 8 μ; white blood-cells, 13,000 per c.mm.; differential count normal.

Blood chemistry.—April 30th: blood calcium, 10·4 mg. per 100 c.cm.; blood-urea, 29 mg. per 100 c.cm. May 3rd: van den Bergh reaction, direct and indirect, negative; bilirubin 0·2 unit. May 9th: serum cholesterol, 88 mg. per 100 c.cm.; serum and cell cholesterol, 192 mg. per 100 c.cm. May 11th: serum cholesterol, 95 mg.; serum and cell cholesterol, 187 mg.

Fractional test-meal.—April 30th: high normal curve; maximal free HCl, 0·23 per cent. (63 c.cm. N/10 per 100 c.cm.); no blood; no excess of mucus; bile present in the last two specimens.

Urine.—May 2nd: reaction, acid; no albumin; deposit consists of amorphous phosphates and oxalate crystals; few leucocytes and red blood-cells; no casts; urinary diastase, 33·3 units.

Other investigations.—Wassermann reaction in blood, negative. Radiography of long bones (April 26th): "the detail of the bone structure appears to be normal." Radiography of chest (May 8th): "Both sides of the diaphragm very high; no definite effusion seen; patch of congestion at the right base." Electrocardiogram: "Low voltage curves in all leads."

PROGRESS AND TREATMENT

On admission the history of fæcal vomiting suggested the diagnosis of gastrocolic fistula, but no fistula was shown by the barium meal. At no time was there any further vomiting. The alternative diagnoses then considered were idiopathic steatorrhœa or some form of abdominal tuberculosis or neoplasm.

The patient was placed on a low fat diet and in view of his macrocytic anæmia he was given Marmite (2 drachms three times a day). The blood picture however failed to improve. The blood counts are given in Table I.

Apart from this his treatment was symptomatic. His general condition improved slightly at first with rest in bed and his diarrhœa became less troublesome. The œdema however increased; his ascites became worse and the bases of his lungs became congested. At no time after his admission was there any other evidence suggestive of congestive cardiac failure. Salyrgan was given intravenously on several occasions and produced a marked diuresis, the urinary output increasing from an average of about 30 oz. to a maximum of 164 oz. in the day. Despite this, his ascites continued to increase and paracentesis

had to be performed on several occasions. (The fluid contained 0·13 per cent. protein. There were a few cells, mainly lymphocytes. No tubercle bacilli were seen.) Examination of his abdomen, even after paracentesis, revealed no tumour. The spleen was never felt. Between the umbilicus and the xiphisternum, however, a hard band could be felt in the abdominal wall. This thickening was thought to be malignant infiltration, probably in the ligamentum teres, the result of metastases from some abdominal neoplasm.

TABLE I.—*Blood Counts*

Date	R.B.C. (millions)	Hb. %	C.I.	Mean diameter (halometer)	W.B.C.
Sept. 27, 1933	4,510	80	0·88	7·6μ	9,200
April 16, 1934	3,540	68	0·9	8·0μ	13,000
May 18, „	3,060	62	1·03	8·0μ	8,000
June 14, „	2,930	50	0·85	—	7,000

The patient's condition was gradually deteriorating and since the diagnosis was still uncertain, a laparotomy was performed on July 3rd by Mr. G. T. Mullally. On exploring the abdomen the liver was found to be small but not cirrhotic. A lump was palpable in the right hypochondrium. The tumour appeared to be a carcinoma of the hepatic flexure, adherent to the liver and to the small intestine. It was inoperable. The patient never rallied after the operation and died on July 6th.

POST-MORTEM FINDINGS

A post-mortem was performed by Dr. R. J. V. Pulvertaft 24 hours after death. He reported as follows:—

The body of an exceedingly emaciated man with a recent abdominal operation wound. The pleural sacs contained a few ounces of blood-stained effusion; the pericardium contained excess fluid. The lungs (right 15 oz., left 14 oz.) were congested at the bases. There was no other disease. The heart (18 oz.) showed extreme brown atrophy. There was no valvular lesion. There was an altogether remarkable absence of atheroma over the complete course of the aorta. The muscles and fat (which was almost lacking everywhere) did not show the characteristic changes of pernicious anæmia. The marrow in the centre of the femoral shaft was yellow and aplastic. The brain (51 oz.) was œdematous, but otherwise normal. The kidneys (right 4 oz., left 4 oz.) were fatty, but showed no nephritis. The prostate and bladder were normal. The suprarenal glands were normal. The spleen (3 oz.) was small and firm and neither it, the liver, nor the kidneys gave a reaction for free iron. The liver (41 oz.) was small, fatty, and friable. It showed no secondary deposits. There was a large subphrenic loculated effusion of serofibrinous fluid. The liver showed a hæmorrhagic area of direct extension of growth. The peritoneum was everywhere thickened and opaque. There were a few calcified tuberculous glands in the mesentery near the ileocæcal valve. The tail of the pancreas was excessively firm. The cæcum was ballooned; there was a fairly large pedunculated polyp in the ascending colon. At the hepatic flexure there was a large fungating malignant growth which had ulcerated through to the third part of the duodenum, at its junction with the second. A fistula about 1½ in. in diameter was thus formed. The ampulla of Vater was identified and a probe inserted along it into the pancreatic duct which was patent. The bile-duct could not be identified. There were no other polyps in the large intestine.

Microscopy.—Colon: colloid and columnar-cell carcinoma. Small intestine: mucosa exceedingly atrophic; villi small or absent; epithelial cells not separately recognisable. Liver: extreme fatty degeneration; some round-cell infiltration. Ligamentum teres: some round-cell infiltration; no evidence of carcinoma. Peritoneum: œdema. Pancreas: marked intralobular fibrosis; atrophy of glandular epithelium; the islets stand out with remarkable distinction and cover roughly three times the normal area. Spleen: fibrosis. Kidneys: very congested; glomerular tufts in general adherent to capsule; no fibrosis. Heart: brown atrophy.

DISCUSSION

Many cases of gastrocolic fistula and gastrojejunocolic fistula have been reported and Verbrugge in 1924 was able to collect 202 cases to which he added 14 from the Mayo Clinic. Before the introduction of the operation of gastro-enterostomy in the treatment of peptic ulcer, such fistulæ were most often the result of carcinoma of the stomach or transverse colon, but since then most of the reported cases have followed the perforation of a jejunal or anastomotic ulcer. In fact, the history of a previous gastric operation is a valuable help in the diagnosis of obscure cases. In analysing his series of cases, Verbrugge noted that fistulæ due to carcinoma were on the decrease, while those following gastro-enterostomy appeared to be increasing in number. He also stated that fistulæ due to extension of malignancy from the stomach or colon developed only in advanced cases in which the cancer had invaded the liver and the abdominal lymph glands. In our case there was no evidence of spread beyond the immediate locality of the growth.

Of the fistulæ secondary to malignant disease those due to carcinoma of the stomach are far commoner than those due to carcinoma of the colon. In a series of 84 cases of gastrocolic fistula collected by Chavannaz in 1917, 38 were due to cancer of the stomach, while only 6 followed cancer of the colon. Fistula due to carcinoma of the colon is becoming even more of a rarity and Golob in 1930 was only able to find 3 additional cases reported (since 1924) and added one further case of his own. We have been unable to find in recent literature any case of a fistulous opening between the duodenum and the colon resulting from malignant disease. Ware (1920) reported a case of jejunocolic fistula occurring two years after the resection of the transverse colon for carcinoma, and Segre (1932) published a case of ileocolic fistula resulting from carcinoma of the colon. He refers to two or three cases in journals to which we have not had access.

The classical picture of gastrocolic fistula is now well known. Usually occurring in a man who has previously had a gastro-enterostomy performed for peptic ulcer, the symptoms are those of an intractable diarrhœa and rapid loss of weight often accompanied by anæmia and occasionally by œdema. The occurrence of fæcal vomiting or flatulence usually makes the diagnosis clear. In our case the possibility of gastrocolic fistula was considered, but the negative X ray report and the fact that after the second admission there was no further vomiting caused the diagnosis to be abandoned. The occurrence of fæcal vomiting on only one occasion was probably due to the site of the fistula. Many authors (Kuttner 1926, Jansson 1928, Camp 1930) have laid stress on the importance of a barium enema in the diagnosis of gastrocolic fistula and have reported cases in which, after a barium meal had failed to demonstrate a fistula, the diagnosis was established by an enema. Had our patient been given a barium enema, the fistula between the colon and duodenum would almost certainly have been revealed. Unfortunately the stools were never tested for occult blood, which must, from the nature of the lesion, have been present.

The sudden onset of diarrhœa and vomiting accompanied by a febrile reaction probably dates the occurrence of the fistula and it is remarkable that this should have been the first symptom caused by a carcinoma of the colon.

The diagnosis of idiopathic steatorrhœa was considered only after it was believed that the

possibility of a fistula had been excluded. The clinical picture of idiopathic steatorrhœa or non-tropical sprue has been recently described by Thayssen (1932) and in this country by Bennett, Hunter, and Vaughan (1932). The outstanding feature of the disease is the steatorrhœa which may be accompanied by intractable diarrhœa. There is usually an associated disturbance of the calcium and phosphorus metabolism with the production of bone deformities and tetany. Extreme wasting and a severe anæmia which may be macrocytic in character are also common. Other less constant features are abdominal distension, pellagra-like skin lesions, and clubbing of the fingers. Achlorhydria is present in about half of the cases and glossitis is a fairly common complaint. Most cases have a history of diarrhœa going back to childhood, but the disease has been described arising in adults who have previously had no intestinal disease. If it arises in childhood, infantilism is usually present.

The outstanding clinical features of our case were the fatty diarrhœa, the weakness and wasting, the macrocytic anæmia, and the anasarca. Fairley and Kilner (1931) have discussed at length the similarity between cases of gastrocolic fistula and sprue. Most of the symptoms of both disorders have been explained on the basis of malabsorption from the small intestine. The wasting and the fatty diarrhœa are readily accounted for on this hypothesis. The excessive fat in the stools in both conditions is well split, indicating normal pancreatic function but malabsorption. A high fæcal fat is by no means an invariable feature of gastrocolic fistula, but if present is of definite diagnostic value. The figures for the fæcal fat in various cases of gastrocolic fistula and in idiopathic steatorrhœa have been collected and are compared in Table II. :—

TABLE II

Fæcal Fat in Gastrocolic Fistula and Idiopathic Steatorrhœa

—	Total fat: percentage of dried fæces.	Percentage of total fat.	
		Split fat (free fatty acids and soaps).	Unsplit fat. (neutral fats).
Normal	20–30	70–75	25–30
Gastrocolic fistula—			
Bolton and Trotter ..	18·8	50·0	50·0
,, ,, ..	29·7	70·5	29·5
Fairley and Kilner ..	33·9	73·9	26·1
,, ,, ..	47·4	72·3	27·7
Strauss	81·0	91·5	8·5
Duodenocolic fistula—			
Authors' case	92·2	68·8	31·2
Idiopathic steatorrhœa—			
Bennett, Hunter, and Vaughan: average of 14 cases*	57·0	75·0	25·0

* Calculated from the figures given in their original paper.

Œdema has often been recorded both in cases of idiopathic steatorrhœa and of gastrocolic fistula. This œdema has also been ascribed to the effects of malabsorption. Strauss (1921) and Poynton and Macgregor (1930) reporting cases of gastrocolic fistula associated with generalised œdema, compared it with the "hunger œdema" of post-war Central Europe. Snell and Camp (1934) state that in two of their cases of idiopathic steatorrhœa "definite œdema of the nutritional type was encountered," and that in this condition "the values for serum protein are often reduced to a level at which any excess of intake of fluid will result in the development of œdema." A low serum protein is now generally considered to be the cause of "nutritional" œdema, though Bigland (1920) in discussing epidemics of nutritional œdema suggests various other possible causes. In two cases of idiopathic steatorrhœa accompanied by œdema of the lower extremities, figures for the blood protein of 4·4 and 4·1 g. per 100 c.cm. have been recorded (Currey 1932, Snell 1932). (Normal: 5·8–8·6 g.) In our patient there was a slight degree of congestive cardiac failure on admission, but this soon improved. The severe œdema, however, persisted and was therefore probably nutritional in origin.

That a macrocytic anæmia may develop in cases of short-circuiting of the small intestine has long been recognised and this has been regarded (cf. Strauss, 1934) as the result of failure of absorption of the product of interaction between the intrinsic and extrinsic hæmopoietic factors described by Castle. This theory is supported by the reported occurrence of macrocytic anæmia after the operative removal of 2 metres or more of small intestine. Castle (1930) has, however, recorded two cases of macrocytic anæmia (in sprue and in multiple intestinal anastomoses) in which, despite a normal gastric acidity, the intrinsic factor was absent from the gastric juice. It appears therefore that malabsorption may not be the only factor in the production of the macrocytic anæmia. This is supported by the account of Vaughan and Hunter (1932) of cases of macrocytic anæmia in idiopathic steatorrhœa treated by marmite, in which the improvement in the anæmia bore no relation to the state of the diarrhœa and was thus probably not related to improved absorption. In their paper and in that of Fairley and Kilner the question of the causation of the macrocytic anæmia is discussed at length.

The relationship of true Addisonian pernicious anæmia to the macrocytic anæmia associated with intestinal disease is also discussed by Vaughan and Hunter. The two forms of anæmia appear to be similar in that they are both macrocytic hyperchromic anæmias and that they both react to liver therapy, but true pernicious anæmia can be distinguished by the following criteria: (*a*) a high indirect van den Bergh reaction is commonly found; (*b*) marked poikilocytosis is usually present in the stained film; (*c*) free HCl is almost invariably absent from the gastric juice; and (*d*) the anæmia is unaffected by marmite. In our case the negative indirect van den Bergh reaction and the presence of a normal or raised gastric acidity support this differentiation. The anæmia, however, did not improve on marmite, but our dosage was only half that advocated by Vaughan and Hunter.

It is of interest that no changes in the calcium metabolism resulted in our case from the long-standing fatty diarrhœa. In two of Fairley and Kilner's cases of gastrocolic fistula the calcium level in the blood was below normal and their cases thus more closely resembled sprue or idiopathic steatorrhœa. A low serum cholesterol was present and a similar finding was reported by Fairley and Kilner. Dr. Pulvertaft has suggested that the complete absence of atheromatous deposits in the aorta might be related to the low blood cholesterol.

SUMMARY

(1) A case of duodenocolic fistula resulting from a carcinoma of the transverse colon is reported. (2) The clinical picture and the pathological findings closely simulated those found in idiopathic steatorrhœa.

(3) The symptomatology of the two conditions is compared and discussed.

Our thanks are due to Dr. de Souza, under whose care the patient was, for permission to publish this case and to Dr. Pulvertaft in whose department all the pathological investigations were carried out. We are indebted to both for much helpful advice and assistance.

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THE ALLERGIC FACTOR IN THE ÆTIOLOGY OF NON-SPECIFIC COLITIS

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THE possibility that allergic factors are of importance in the ætiology of non-specific colitis has emerged from the study of a group of 38 cases, of which the relevant features are recorded below. Information was sought in these cases with regard to the occurrence of the allergic disorders of asthma, hay-fever, spasmodic rhinorrhœa, migraine, bilious attacks, urticaria, eczema, and epilepsy. Food idiosyncrasies and appetite in childhood were also the subject of inquiry.

The incidence of the allergies among the general population was studied by Bruce Pearson (1933),[1] who found that 26 per cent. of healthy adults have either a personal or family history of allergy. It may therefore be significant that among these colitis patients as many as 32 of 38 patients, or roughly 85 per cent., gave a personal or family history of allergy.

The patients studied were all women and, with two exceptions, were treated as in-patients; the usual methods of investigation and diagnosis were employed, including sigmoidoscopy, X ray and stool examinations. The diagnosis of this form of colitis has been based on the appearance of the mucous membrane, which is abnormally granular and congested and bleeds readily on touch; actual ulceration may or may not be present. The term non-specific colitis is used to include "ulcerative" and "hæmorrhagic" colitis, but not "muco-membranous" colitis. X ray examination may show little change in the early cases and diagnostic appearances in later conditions. The stools contain blood and mucus during some part of the attack.

ALLERGIC HISTORIES

The cases have been grouped as follows, according to their allergic histories:

Group I.—19 cases. "Strongly positive." Cases with a personal history of one or more definite allergies with periodic recurrences and a positive or unknown family history.

Group II.—11 cases. "Weakly positive." Cases with a personal history of single or slight allergic attacks, with or without a positive family history.

Group III.—2 cases. Negative personal history with positive family history.

Group IV.—6 cases. Negative personal and family histories.

The allergic histories of Groups I., II., and III. are summarised below under their case numbers.

GROUP I.—"*Strongly Positive*"

1. Bilious attack and eczema. Mother migraine, sisters urticaria.
2. Migraine and eczema. Brother urticaria, badly.
5. Hay-fever badly, urticaria. Sister migraine.
6. Migraine, bilious attacks, urticaria. Mother and maternal grandmother severe migraine, brother and sister urticaria.
7. Migraine, bilious attacks. Mother and sister migraine.
20. Rhinorrhœa, migraine, urticaria, psoriasis. Mother hay-fever, sister hay-fever and psoriasis.
25. Migraine, bilious attacks, urticaria. Mother migraine and rhinorrhœa.
35. Rhinorrhœa, slight migraine, severe bilious attacks. Mother migraine.
36. Hay-fever, bilious attacks. Sister hay-fever, migraine.
44. Hay-fever. Father and two brothers hay-fever.
45. Bilious attacks, urticaria. Father asthma.
46. Hay-fever, migraine severe. Mother and sister migraine.
47. Migraine, bilious attacks, urticaria. Mother asthma.
49. Rhinorrhœa, migraine severe. Sister eczema, sister epilepsy.
51. Asthma once, bilious attacks. Aunt asthma.
52. Urticaria severe. Sister migraine, sister eczema.
22. Chronic asthma.
38. Rhinorrhœa, migraine, bilious attacks, urticaria.
50. Migraine severe.

In Cases 22, 38, and 50 the family history is unknown.

GROUP II.—"*Weakly Positive*"

8. Recurrent spasmodic rhinorrhœa. Family negative.
12. Migraine and bilious attacks. Family negative.
13. Urticaria severe, one attack. Mother migraine, sister eczema.
15. Eczema as child. Sister migraine, sister eczema.
19. Urticaria, one attack. Brother spasmodic rhinorrhœa, mother eczema.
27. Urticaria, slight migraine. Family negative.
31. Migraine. Family negative.
32. Bilious attacks severe. Family negative.
34. Migraine. Family negative.
41. Bilious attacks. Mother migraine severe.
48. Bilious attacks, severe recurrent.

GROUP III.—*Negative Personal History and Positive Family History*

16. Brother asthma.
23. Brother spasmodic rhinorrhœa, mother migraine.

The different allergies appear in the histories with the following frequency.

Allergy	Patients	Family	Allergy	Patients	Family
Asthma	2	3	Bilious attacks	13	—
Hay-fever	4	5	Urticaria	11	4
Rhinorrhœa	2	3	Eczema	6	6
Migraine	10	13	Epilepsy	0	2

Food idiosyncrasies.—Nine patients were reported to have suffered from capricious appetite or to have been difficult to feed as children. No special food idiosyncrasies were discovered, though inability to take fats or milk and a dislike to green vegetables or oranges appears with some frequency.

Severity of colitis in relation to allergic history.—The severity of the colitis when considered in relation to the allergic history seems to indicate that the allergic patient suffers severely or develops a chronic form of the disease. Of the 16 patients with a definite personal and family history, 13 suffered from severe colitis attacks or from chronic invalidism, 2 were moderately severe cases, and only 1 had never had an acute attack. The other groups contain cases of moderate or slight colitis, though two severe cases appear in the "negative" group.

A further group of 15 cases had been studied before the investigation of the allergic histories was begun, and the observations discussed below are based on 53 cases in all.

DISCUSSION

Colitis is a disease common in young females; the incidence is probably not less than twice as high in females as in males. Males are more susceptible when under fifteen and over forty years of age, and females between the ages of fifteen and forty-five (Hern, 1931).[2] This difference in the age of onset and its distribution between the sexes is also common in allergic disorders (Bray, 1934).[3]

Allergic disorders are intermittent or remittent in nature; the attacks tend to become more severe, more frequent, and in the end continuous. This applies also to colitis. The true onset often occurs with trivial symptoms and may be unrecognised; intermissions and relapses of increasing severity and duration are characteristic of the disease.

Physiological states have a definite influence on the course of allergic diseases; menstruation is recognised as liable to produce exacerbations, and pregnancy on the other hand gives comparative freedom from attacks. These tendencies are noted in colitis; the remissions, in cases with chronic symptoms, during pregnancy are striking.

Allergic tendencies may remain latent and the first attack may be precipitated by an infection. In 13 cases in this series, the first onset of colitis was closely related in time to infectious disease of the upper respiratory tract, as influenza, acute catarrh, tonsillitis, mumps, and whooping-cough; gastro-intestinal disorders appear relatively less frequently than the respiratory as "causes" of either first attacks or relapses. Among 40 relapses, 21 were ascribed to one of the following: colds, sore-throats, tonsillitis, quinsy, bronchitis, influenza, and whooping-cough. The incidence of slight sore-throats, pharyngitis, and nasal catarrhs in colitis patients is very high, and these complaints are almost constantly accompanied by an exacerbation of colitis. In asthma, an infective disease is often the "cause" of the initial and recurrent attacks, and slight catarrh, "the allergic cold," precedes a relapse (Bray, 1934). Colitis is undoubtedly associated with arthritis and erythema nodosum as occasional complications, but the significance of these manifestations and their relations to the allergies remains doubtful at present.

The allergic response of sensitised tissues is characterised by increased permeability of capillaries, œdema of mucous membranes, and spasm of unstriped muscle, and the functional and pathological changes in colitis are very similar to the allergic tissue reactions. Swelling and œdema of the mucous membrane is present with increased permeability of the congested capillaries, for on examination the intact mucosa bleeds freely on the slightest touch; the discharge of mucus is usually profuse and spasms of the muscle producing painful colic are characteristic. The selective attack of the recognised allergic disorders on certain structures is paralleled by colitis, for a remarkable feature of the disease is its sharp limitation to the colon. One of the most important functions of the colon is that of excretion, and it may be a process of excretion of bacterial products that exposes the tissues to special damage or "sensitisation." It has been shown experimentally by Flexner (1906)[4] and Paulson (1928),[5] working with dysentery toxin and streptococcal products respectively, that these are eliminated chiefly by the colon and produce severe local reactions. That a true allergic sensitisation to other bacterial products may follow an initial attack of a specific toxin, is suggested by the work of Sanarelli (1924)[6] with cholera. No single specific infection has been found in colitis, though streptococci of various types are almost invariably present in considerable numbers and streptococcal allergens may play an important rôle.

There are thus many points in favour of the theory that the allergic factor plays a part in the ætiology of specific colitis.

The patients reported on in this paper were in attendance at the Elizabeth Garrett Anderson and Royal Free Hospitals, and I am indebted to several of my colleagues at these hospitals for giving me access to their cases.

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Clinical and Laboratory Notes

A FATAL CASE OF ASPIRIN POISONING

WITH POST-MORTEM FINDINGS

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THOSE who have read Dr. S. C. Dyke's admirable paper[1] on poisoning by acetylsalicylic acid may perhaps be interested to read an account of a case which came under my notice recently.

About 5 o'clock in the afternoon a harvest worker noticed a young man lying in a field. She spoke to him but received only a few words in reply. Realising that he was very ill she secured help and ultimately, about 7 o'clock, the local police surgeon examined the patient. He was deeply comatose and there was nothing to suggest injury. A few minutes after the arrival of the surgeon the patient died. It was found that his clothes were literally soaking with perspiration.

I conducted a post-mortem examination 17 hours after death. The body was that of a somewhat underdeveloped male, 23 years old, showing post-mortem lividity. Rigidity was present in the legs, passing off in the arms, and quite passed off in the neck. Nutrition was good and the pupils were moderate and equal in size. On opening the chest the thymus gland was found to be persistent.

The lungs showed numerous petechial hæmorrhages on

[1] THE LANCET, Sept. 14th, 1935, p. 613.

the serous surfaces and the lower lobes were deeply congested. The left lung weighed 20 oz., the right lung 24 oz. The pericardium was normal; numerous petechial hæmorrhages were seen on the epicardium, especially on the posterior aspect of the heart; there was slight hypertrophy of the left ventricle to compensate a mild degree of mitral incompetence; and the heart weighed 12 oz.

The stomach contained about 80 c.cm. of foul black slimy fluid. The gastric mucosa was red but had no gross lesion to account for the blood in the stomach. In the black slimy fluid were observed tiny white gritty particles. The particles were examined and were found to burn with a white luminous flame and to have a melting point of 138° C. A solution of one of these particles in a little water was acid in reaction and gave a purple colour with ferric chloride. Some of the particles were heated with methyl alcohol and sulphuric acid and gave the characteristic odour of wintergreen. Much aspirin was also found in solution in the stomach contents.

The peritoneum was healthy. The liver weighed 59 oz. and appeared healthy. Microscopically the earliest stage of chronic venous congestion was seen—i.e., congestion and dilatation of the sinusoids in the central zone of the liver lobules. A few fat globules were present. Viewed under the high power of the microscope the liver cells were seen to contain very numerous tiny yellowish-black granules. The gall-bladder contained watery golden bile, but no stones. The spleen weighed 7 oz. and was congested. The kidneys each weighed 6 oz. and had the appearance of cloudy swelling. Microscopically examined, sections stained by hæmatoxylin and eosin showed that most of the glomeruli were congested with blood and swollen so as almost to fill the capsules of Bowman. Yellowish-black particles, similar to those found in the liver were present in the kidney especially in the glomeruli, but were not so numerous as in the liver. Cloudy swelling of renal epithelium was observed. The head was not examined.

Unfortunately no clue to the amount of aspirin ingested by this patient was obtained. There is reason to believe that it had been obtained in the form of tablets, crushed in the hands and swallowed dry. The dose was probably taken between 1 P.M. and 3 P.M. The features of the case which appear to be important are: (1) the signs of very profuse perspiration; (2) the presence of blood in the stomach and petechial hæmorrhages on the serous membranes; (3) the condition of the kidneys, amounting practically to a glomerulo-nephritis; and (4) the presence of granules in the liver and kidney cells probably representing an attempt to deal with the drug.

My thanks are due to Dr. C. C. Easterbrook for permission to publish these details and to Mr. Hawley, county analyst, Dumfries, who assisted in identification of the poison.

SALIVARY GLAND TUMOUR

By D. C. L. Fitzwilliams, C.M.G., M.D. Edin., F.R.C.S. Eng.

SENIOR SURGEON TO ST. MARY'S HOSPITAL, LONDON

MIXED tumours of the salivary glands so rarely cause death from secondary metastatic growths that the following case seems worthy of record.

The patient, aged 48, a confidential maid, was admitted to St. Mary's Hospital for the last time on June 20th, 1934.

History.—In May, 1930, she had been operated upon in St. George's Hospital for a submaxillary swelling, which on pathological examination resembled a mixed parotid tumour. In December of the same year she had X ray treatment to the area, but whether because of recurrence or as a precautionary measure was uncertain. In 1932 the tumour recurred and was removed from the same region; it was described as a myxo-endothelioma. In October, 1932, another operation was performed in St. George's Hospital for removal of a part of the same submaxillary gland. In June, 1933, she was sent by Dr. Fairfield Thomas to see me at St. Mary's Hospital with a large painful swelling under the left side of her jaw. The tumour was painful to touch, ached, and kept her awake, and she had to take sedatives to make her sleep. On ascertaining her history I thought it best to send her to see her former surgeon who had operated twice already. On being told that he could do nothing more for her she returned to me.

Examination and treatment.—The swelling extended from near the symphysis back to the sternomastoid muscle and spread over the jaw on the left masseter muscle; it was fairly well defined, craggy and irregular, as if growing from a number of different centres. It was attached to the skin and deeper structures. It was obviously infiltrating tissue outside the old capsule of the submaxillary gland, and removal was not considered possible. No enlarged lymphatic glands could be felt in the neck. Radium was applied interstitially. Twelve 2 mg. needles were inserted in gridiron fashion under the tumour, eight horizontal and four vertical. They were removed on June 30th, 1933 (dose 5760 mg.-hours).

Course of illness.—The patient left hospital on July 1st and reported at three-monthly intervals. As the result of the treatment the tumour fibrosed rather than disappeared, but the pain went and sleep returned. She was quite well and gave up attending hospital. On Oct. 19th, 1934, however, Dr. Fairfield Thomas again sent her to see me and she was again admitted to St. Mary's, as she complained of weakness, breathlessness, and being readily fatigued. She had the frequent reasonless little cough so characteristic of irritation of the vagus. The base of her right lung was dull from the seventh rib downwards, and the breath sounded distant. An exploring needle obtained no fluid. She had pain in her chest and a rub could be heard on the right side. There was no sign of her old tumour to be seen or felt locally. On Oct. 22nd half a pint of fluid was aspirated and her breathing improved; no organisms or characteristic cells were found. On Nov. 6th she still had pain and was breathless; she was tapped again and a pint or more drawn off. On Nov. 11th she still had pain and was breathless. She vomited and went rapidly down hill and died on Nov. 30th.

Post-mortem.—There was a mass of hard growth on the left side of the neck extending from just below the auricle to the midline and reaching the lateral wall of the pharynx. It was impossible to identify either parotid or submaxillary glands in the mass, which was eroding the mandible in the submaxillary region. The deep cervical glands on the left were extensively involved. Both pleural cavities contained fluid, with more on the left. About forty plaques of growth 1–2·5 cm. in diameter were present on the left pleural surface of each lung, and one 4·5 cm. in diameter on the left side. Similar nodules were seen on the pleural surface of the diaphragm, and rather larger nodules scattered through both lungs. Between the lobes were similar plaques, but here they were more confluent. The nodules were umbilicated on the surface and on section were cystic with small mucinous areas.

Microscopical examination.—Portions of the growth from various parts of the neck and lung are essentially similar in structure. Some parts are very degenerate. They are best preserved in the lungs where the structure is that of a very cellular salivary gland tumour. The cells are sometimes polygonal in small solid masses, sometimes columnar in tubes and alveoli, and sometimes drawn out with long processes lying in a mucinous stroma. Mitotic figures are present in small numbers. Fibrous stroma is less than is usually seen in an innocent salivary gland tumour.

I have operated on some eighty mixed tumours of the salivary glands and I have never met a case similar to the above. Operation combined with a heavy dose of radium applied interstitially (4000–6000 mg.-hours) seems to cure these tumours absolutely. I can recall only two cases of recurrence since I adopted irradiation, and they date from the time that a less heavy dosage of radium was used. I fancy that the size of the tumours now encountered is smaller than formerly: in other words, an earlier diagnosis being made and early treatment adopted.

MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE

SECTION OF ORTHOPÆDICS

AT a meeting of this section held on Oct. 1st Mr. C. MAX PAGE read his presidential address on the

Development of Orthopædic Surgery

The term "orthopædic surgeon," he said, was now so well established that it was not likely to be displaced, although later developments had marred its aptness. The word "orthopædic" had, he thought, been introduced in 1741 by Nicholas Andry, who had in that year published a work entitled "Orthopædia," with such chapter headings as "In what Posture Young Girls ought to sew, read, &c.," and "The Means of preventing the Bellies of Children from projecting too far forward and how to keep their Backs straight." The limited application of the term to the correction of deformities in children had already been lost when the orthopædic surgeon began to treat adult deformities early in the nineteenth century, and since the late war the subject of orthopædics had so expanded that it might now be properly considered as that section of general surgery which dealt with any disorder of the locomotor apparatus. In order to trace its development a large part of the history of general surgery must be considered, as well as that of the minor specialties of bone setting, medical gymnastics, and physiotherapy, which had become more or less incorporated into the main subject.

The Hippocratic canon showed a surprising knowledge of the treatment of fractures, dislocations, and deformities and a clear conception of the measures adapted to the restoration of function after injury and the best position for joints which might become stiff. Hippocrates had differentiated caries of the spine and knew its association with lung disease. Later classical writers, such as Celsus and Galen, showed less interest, and their work did not advance the treatment of fractures and deformities. Celsus, however, had described the treatment of hæmostasis and had recommended the ligature for arterial bleeding. Galen, as medical officer in charge of the gladiatorial school at Pergamum, had introduced an absorbent wound dressing soaked in wine, and recorded that wounds treated thereby did not become inflamed. No case had died under this treatment during his four years of office. The Roman surgeons of the later Empire period were mostly illiterate and of poor social standing, but they had an extensive experience of injuries, and the instruments in use indicated a high standard of efficiency in surgical technique. A bronze specimen in the Hunterian museum suggested that these surgeons had introduced the all-metal artificial limb. The surgery of injuries and deformities owed little to the era of Arabian medicine. In the Middle Ages a few men of the Italian and French schools, such as William Salicet, Lanfranchi, and Henri de Mondeville, had left records which showed that originality and surgical enterprise were not dead, but until the Renaissance there had been no vigorous life in medicine or surgery.

AFTER THE RENAISSANCE

There were definite signs of a reawakening in the practice of surgery in the fourteenth century. Most surgeons of that period had had realistic experience of war surgery, and to this might be attributed the thrust to free their art from the jealous and reactionary control of the physicians and schoolmen. In 1363 Guy de Chauliac of Montpellier had published his "Grande Chirurgie," which had become a classical treatise until the time of Paré. In this book the author described the treatment of fractured femur by lead-weight traction over a pulley, the limb being kept in position by straw bolsters on either side. The increased use of firearms had added a new complication to wound treatment in the fifteenth and sixteenth centuries. The first to write on this subject had been John of Vigo in 1514, and he, in common with most surgeons of that century, had taken the view that all gunshot wounds were poisoned. Anyone who had had experience of anaerobic infections caused by low velocity missiles could understand this view, but it had led to a serious setback, and primary treatment with the cautery and boiling oil had become a routine. The publication of his text-book of anatomy by Vesalius in 1543, and subsequent additions to the subject by Fabricius, had put surgery on a higher plane and paved the way for a general advance in southern Europe. The outstanding figure of this professional renaissance was undoubtedly Ambroise Paré, a man of humble extraction who had started his career with no great education. By his own merit he had risen from the post of army surgeon to become chief surgeon to four successive French kings. His extensive writings on surgery and midwifery were all in the vernacular, and for this reason he had incurred great enmity among established physicians. Nevertheless, his work had been of great service to the practical but mostly unlettered surgeons of his own period. His well-known simplification of wound treatment had been revolutionary at the time and neither this nor his rediscovery of the ligature for major operations had become part of accepted surgical practice for several centuries. His attitude towards authority was indicated by his remark: "Il ne faut pas s'endormir sur la labeur des anciens comme s'ils avaient tout su ou tout dit." His aphorism, "Je le pansais, Dieu le guérit," showed an attitude of mind much above that of the medical man of a much later time. His contributions to the surgery of injuries and deformities had been extensive, and he had figured orthopædic appliances of no little interest, including a spinal jacket for scoliosis and a series of artificial limbs, some of which were so complicated that it was doubtful if they could ever have been put to practical use.

An English contemporary of Paré was Thomas Gale, who had written a surgical treatise of some interest. He had recorded a visit to the royal hospitals of St. Bartholomew and St. Thomas in 1562, and had commented that "it was saide that carpenters, women, weavers, cobblers and tinkers did cure more people than the chirurgians." In Germany Wurtz had published his "Practica der Wundarznei" in 1563. In this he had advised against the practice of cauterising wounds. Among his case histories was an interesting observation on suppuration about the knee-joint. "Do not allow the knee to remain quiet, but stretch the surrounding parts and manipulate them as much as you can in order that the joint may not become permanently rigid; for if you wait till healing is completed before you resort to these measures you will often find that it is already too late." Another piece of advice he gave was: "In practical surgery much more importance attaches to the manner in which one carries out one's manipula-

tions and to the amount of experience which one may have acquired, than to the length of time one devotes to windy consultations."

MODERN SURGERY

Modern scientific medicine might be said to find its beginnings in the seventeenth century in the work of Vesalius, Harvey, and Morgagni. The surgery had made no appreciable technical advance until the latter part of the eighteenth century. The work of John Hunter on bone growth and bone repair had introduced the controversy on the relative osteogenetic function of periosteum and bone. The controversy had lasted into the nineteenth century and had had to await the work of the modern surgeon for final settlement. Three general surgeons had contributed valuable work to orthopædics at about this stage: Percival Pott, Syme, and Dupuytren. In Sir Arthur Keith's opinion Jacques Delpech (1777–1832), professor of surgery at Montpellier, had been the first true orthopædic specialist. To him was attributed the introduction of subcutaneous tenotomy, and he had written "l'Orthomorphie," the first work to concern itself with bone and joint deformities. In the early nineteenth century the specialty had been mainly in the hands of men whose operations had been limited to tenotomies and osteotomies. The next stimulus had come with the introduction of general anæsthesia, followed shortly afterwards by the work of Pasteur and Lister. The full harvest, however, could not be reaped until Sir Arbuthnot Lane and others had demonstrated the true meaning of aseptic technique. The other powerful influence had been the discovery of X rays; the present generation could hardly appreciate the advances in accuracy of diagnosis which the development of this technique had brought.

Mr. Page concluded by a reference to the debt of surgery to military experience which attained its peak in the late war, when guided by such men as Robert Jones, Brackett, and Putti, the level of orthopædic surgery was raised to a plane that could only have been reached by a much longer peace-time effort. A minor specialty was thus transformed into one of the major branches of surgery. Of the future, he said that many orthopædic problems awaited solution—for example, the cause and control of the disorders of the growing bone and its reaction to injury. Of those minor and major curses of civilised man, fibrositis and the like and chronic rheumatism, the primary cause was still obscure and no effective method of control had been discovered, despite all the elaborations in the sphere of treatment. If orthopædics was to continue to advance help from every branch of medicine must be enlisted. Recruits from the general surgeons must be encouraged, and close touch maintained with physician, pathologist, and biochemist.

REVIEWS AND NOTICES OF BOOKS

Urology in General Practice

By ALEX E. ROCHE, M.D., M.Chir. Camb., F.R.C.S. Eng., Assistant Genito-Urinary Surgeon, West London Hospital; Consulting Urologist, London County Council. London: H. K. Lewis and Co., Ltd. 1935. Pp. 356. 17*s.* 6*d.*

MANY books have been written by urologists for the general practitioner. The preface of such books almost invariably suggests that it is impossible for the overworked practitioner to keep in touch with progress in all branches of medicine, and that the author has prepared the work with the intention of summarising all that it is essential that he should know. It is in what the practitioner should be expected to know that authors differ. Sometimes this would appear to be deemed very little; sometimes it is apparently necessary that he should understand the technique of major operations and be capable of undertaking expert urological examinations.

Mr. Roche has been successful in hitting the mean between these two extremes. Whilst he has described in detail certain minor examinations such as cystoscopy, operative technique, beyond certain broad principles, is not detailed. Moreover, the space allotted to the various subjects is not determined by the importance of the disease but by the frequency with which it occurs in general practice and the likelihood of the particular lesion remaining undiagnosed and therefore improperly treated. For example, renal tuberculosis is discussed rather briefly, whilst torsion of the spermatic cord, which is generally misdiagnosed as acute epididymo-orchitis, receives considerable attention. Mr. Roche not only knows what the practitioner requires, but manages to supply it in an interesting manner and in excellent English. This deserves notice for it has been hinted in criticism of the florid style adopted by many surgeons that there must be some incompatibility between skill in handling the scalpel and the pen. The illustrations are excellent and the general production of the book is of a high quality.

Practitioner's Library of Medicine and Surgery

Vol. VIII. *Therapeutics.* Edited by GEORGE BLUMER, M.A. Yale, M.D.; DAVID P. SMITH, Clinical Professor of Medicine, Yale University School of Medicine; and ALBERT J. SULLIVAN, B.S., M.D., Assistant Professor of Medicine, Yale University School of Medicine (Associate Editor). New York and London: D. Appleton-Century. Company, Inc. 1935. Pp. 1031. In sets of 12 at £2 10*s.* per volume.

THE "Practitioner's Library" is a series of large and handsome volumes, well printed and planned, it would seem, with the idea that the practitioner who can afford to buy them may dispense with all other text-books. The chapters in this volume on therapeutics are written by 34 American physicians and surgeons, and by one British contributor, Dr. Donald Hunter, who writes on endocrine disorders. The editors have tried to present the whole field of the therapeutics of general practice in some sort of perspective, and, difficult though this is in a book of composite authorship, they succeed remarkably well. This success is partly at least due to the series of short essays on general therapeutics, which occupies the first third of the book, wherein are discussed the principles of the various types of therapy, such as diet, serums and vaccines, radiation, psychotherapy, and so forth. The reader will find here much that is obvious and familiar, but he will also be reminded of some things that he has forgotten. A chapter on the principles of drug therapy might with advantage have been included. Bombarded by the glowing commercial recommendations of all sorts of treatments, new and old, the modern

doctor can easily lose sight of fundamental therapeutic principles, and it is only by clinging to these that he can save himself from rule-of-thumb medicine.

The larger section of the book works through the conditions usually discussed in a text-book of medicine, following the common text-book arrangement, and saying under each heading just enough about diagnosis to orient the reader. The treatment described is the whole management of the patient, including such measures as rest in bed (where indicated), the nursing procedures of special importance, and the records essential to proper control of progress. Mostly a clear indication is given of the effect to be expected from the various drugs or procedures recommended; the reader is not given a bewildering choice of remedies which "may be exhibited" or "have been advocated." The clear view of principles and the concrete advice on details provided in this volume should make a strong appeal to the practitioner.

Elementary Zoology for Medical Students

Third edition. By L. A. BORRADAILE, Sc.D., Fellow and Tutor of Selwyn College, and Lecturer in Zoology in the University of Cambridge. London: Humphrey Milford, Oxford University Press. 1935. Pp. 429. 10*s*. 6*d*.

Dr. Borradaile's "Manual," of which this is the abridged edition, is still perhaps the most popular text-book of elementary zoology. Sound and accurate descriptions of the type specimens and excellent diagrams have assured for it a long and useful life. The third edition has been improved, notably by the omission of some and the addition of other types, and by the enlargement of the chapter on embryology. It can no longer be considered adequate as a complete introduction to zoology, but in the realm of pure morphology it has still to meet its rival.

Diseases of the Thyroid Gland

Third edition. By ARTHUR E. HERTZLER, M.D., Chief Surgeon, Halstead Hospital; Professor of Surgery, University of Kansas. With a chapter on Hospital Management of Goitre Patients, by VICTOR E. CHESLEY, Chief Resident Surgeon, Halstead. London: Henry Kimpton. 1935. Pp. 348. 32*s*.

THE opinion of a surgeon who has had ample material for making a special study of thyroid disease provoke thought and invite criticism, particularly when his beliefs are not influenced by the views of other clinicians and research workers. The outstanding feature of Prof. Hertzler's monograph is its individuality. He argues that as in his experience almost all goitres sooner or later become toxic, and since this toxicity never subsides spontaneously but leads inevitably to death from heart failure, the only sound treatment for every type of goitre is removal, and *radical* removal, at the earliest opportunity. He points out that the more lengthy follow-up of his earlier cases has served only to confirm the views expressed in the earlier editions of this work. Now that a concerted effort is being made to simplify the nomenclature of diseases of the thyroid gland it is unfortunate that Prof. Hertzler should be unable to accept the terms commonly agreed upon, for it is impossible to correlate his classification with the clinical and pathological types described in text-books and other monographs. He gives one the impression that cellular overactivity is comparatively unimportant, and that the colloid, particularly when it is degenerating, is the source of the toxic secretion of the thyroid gland; and he goes further even than this by suggesting that stored colloid may excite excessive secretion.

This is not a text-book suitable for students, but the young surgeon faced with the management of a case of toxic goitre will be greatly helped by the advice given in the chapters on pre- and post-operative treatment, and on surgical technique. In these sections the book conforms more closely to orthodox practice, though we cannot agree that strips of gauze make satisfactory "drains." It would have been interesting to learn how many patients have to be kept permanently on thyroid medication after the radical thyroidectomy recommended for toxic goitre.

The book is written in the style of a popular lecture. Even those accustomed to the vivid diction of the Middle West, may be startled to read a summary of the neurogenic theory of thyrotoxicosis in these terms: "True it has been demonstrated that tickling the basal ganglia of animals will cause their eyes to bung out and their pulse to become rapid." The book is profusely illustrated with photographs and many excellent drawings.

Pacemakers in Relation to Aspects of Animal Behaviour

By HUDSON HOAGLAND, Professor of General Physiology, Clark University. New York: The Macmillan Co.; London: Macmillan and Co., Ltd. 1935. Pp. 138. 12*s*. 6*d*.

BEHAVIOURISTS in their attempt to explain animal and human behaviour in terms of established chemical and physical laws have in general confined themselves to the investigation of the external stimulus-response relation. The author points out that they have neglected an important aspect of the problem. There are many continuous physiological processes which occur in the body more or less independently of external stimuli. Such "pacemaker" reactions which, as much as morphological structure, determine the course which actions may take, can be investigated by physico-chemical methods.

All living cells maintain their individuality in an environment from which they differ by the continual expenditure of energy. A "dynamic steady state" is maintained which entails the continual building up and breaking down of substances, the temporary upset of which forms the basis of many physiological events, including the passage of a nerve impulse. This book is mainly concerned with the rhythmic discharge of impulses which Adrian and others (including the author) have shown to occur in certain parts of the nervous system independently of external stimuli, though they may be modified or even inhibited by the latter. Such a rhythm constitutes a "pacemaker." An interesting chapter deals with the idea that internal rhythms in man serve as a "physiological clock" which is normally set to "physical" time. Under different conditions (such as fever) and at different ages the speed of the "physiological clock" alters, thus making time appear to pass at a different rate. These suggestions are supported by some very convincing experimental evidence. Whether or not we believe that physico-chemical analysis will ever solve all aspects of behaviour there can be no doubt of the importance of internal changes of this kind.

THE LANCET

LONDON: SATURDAY, OCTOBER 5, 1935

THE D.C.H.

THE first examination for the new Diploma in Child Health of the English Conjoint Board is now in progress. The type of examination, the standard required, and the proportion of successful candidates will be closely studied by the deans of the medical schools, and others concerned with medical education, with a view to organising, if need be, special courses of preparation for future occasions. The syllabus is wide and somewhat vague. Anatomy, pathology, physiology, development, hygiene, dietetics, disease, therapeutics, legislation—all as affecting the child—make a formidable list. The preventive aspect also, according to the regulations, is to receive attention and this may well demand, and should obtain, the close coöperation of public health authorities. A course in pædiatrics at a children's hospital to cover the syllabus, with a certain number of lectures by visiting members of the administrative health services, would however have a significance beyond mere preparation for examination purposes. It is no secret that the establishment of the new diploma was prompted by a feeling on the part of pædiatricians that medical officers of child welfare centres had often received no special training in the recognition and treatment of diseases of infancy and childhood. To this it is possible for the health authorities to retort that what is learnt and taught in the wards and out-patient departments of children's hospitals is not preventive medicine and that well children are not seen in these institutions. But this would only be true if all the children attending a children's out-patient clinic had gross evidence of disease, whereas in point of fact the clinical material of such a department and that of an infant consultation clinic may not differ very much; both undertake preventive work, at both treatment is available. There are more healthy children attending the latter and that is the main difference. The preventive aspect of pædiatrics is not a separate subject; it is an attitude of mind and can as well be taught by pædiatricians as by public health authorities. Obviously it will be to the good of pædiatrics if the new diploma leads to a close coöperation between all those working for the health of the child. If the institution of the new diploma serves to bring medical officers of health within the walls of a children's hospital, and to make more use of trained pædiatricians in welfare clinics and school medical work, it will have an importance far out-reaching the acquisition of three more letters after the doctor's name. If it affords a standard of training in pædiatrics for those entering the public health services, it may also remove the lag between the scientific discovery and its application in clinical work. Why, for example, should rickets still occur when its ætiology and prevention are so well understood?

There is one other aspect of the new diploma of which sight should not be lost. It would be a great pity if its establishment and the organising of special courses to cover the syllabus should lead pædiatricians to slacken their energies to get the medical curriculum right. The D.C.H. has nothing whatever to do with the place of infant hygiene and diseases of children in the qualifying examinations. Dr. ROBERT HUTCHISON speaks for all his colleagues in demanding the recognition of pædiatrics by the universities (see p. 785). The General Medical Council has agreed that some test of a candidate's knowledge of these subjects should be made, but the word "always" was deliberately omitted from its admonition and there is nothing in recent reports on the curriculum to show that the position is being made clearer. Indeed in the recommendations of both the curriculum conference and of the G.M.C. curriculum committee pædiatrics is in a state of some confusion, instruction being allocated to several departments—i.e., as a branch of the medical, surgical, and midwifery portions of the student's life—while examination is classed vaguely with obstetrics and gynæcology. A post-graduate diploma will not remove the need for insisting upon more knowledge about children in health and disease on the part of every practitioner of medicine.

IMMUNISATION AGAINST SCARLET FEVER

IT might be supposed that the value of active immunisation against scarlet fever would be generally recognised in the United States of America, where the method originated. Dr. J. NORMAN HENRY,[1] however, finds "the same obstructive conservatism holding back the general adoption of scarlet fever prevention" as retarded specific prophylaxis against diphtheria, for which "ten years of accumulated fact was needed before final and complete acceptance was obtained in spite of indisputable scientific proofs." These are plain words, and they apply with even more force to this country, where active immunisation against diphtheria was even longer in travail and where protection against scarlet fever is seldom attempted, except in institutions. HENRY reports that at the Philadelphia Hospital for Contagious Diseases active immunisation of the staff against scarlet fever began in 1926 and was followed by the same results as, for example, in the Birmingham and Edinburgh City Hospitals. The "usual heavy incidence" of staff cases ceased and there was no more scarlet fever among the fully immunised. This happy state of affairs continued until 1929 when "a former director of public health was persuaded to abandon compulsory immunisation." The disease again appeared among the staff, 12 cases developing during the fourteen months of suspension. The measure was then reintroduced, and the result was that the staff has ever since been free from the infection.

[1] Jour. Amer. Med. Assoc., August 17th, 1935, p. 488.

In Philadelphia Dick-testing and immunisation started in the latter part of 1932, and by last March 10,057 children had been tested. They comprised 4053 living in institutions and 6004 coming from private homes to ten health centres conducted by the department of public health. Of the institutional children only 26 per cent. were found to be positive reactors as compared with 58 per cent. of those from households. The number of injections in the immunising course was five, but the skin-test doses in each injection, or in the aggregate, are not stated in HENRY'S paper. Since, however, Dr. GLADYS DICK herself inaugurated the scheme in Philadelphia it may be assumed that the scale of dosage was that advocated by the DICKS.[2] In a first series of 790 children injected 30 per cent. showed slight reactions, most commonly after the third or fourth dose, and in 4 per cent. the reactions were considerable. The reaction syndrome—though all the symptoms seldom appeared in the same child—consisted of nausea and vomiting, pyrexia (103° F. maximum), sore-throat, scarlatinal rash, and arthritic and abdominal pains. There were no troublesome local reactions. Symptoms always appeared within six hours and disappeared a few hours later. It was notable that when rest in bed and a light diet were ordered after an injection, any but the mildest reactions were very rare. The adoption of these precautions is perhaps the reason why in a later series of 1035 cases the proportion of reactions was much smaller. As for results: no case of scarlet fever has occurred among the institutional children found by the immunologists to have become negative reactors; while among the 3404 children inoculated at health centres only 3 cases have developed. Of these 3 children 2 had been positive reactors on the first retest but became negative after a further injection; the third had been negative at the first retest; and in all 3 a year elapsed before the attack of scarlet fever. Another child, the subject of Little's disease, with a previous history of scarlet fever, gave a primary negative test but developed a second attack of scarlet fever a few weeks later. Repeated Dick tests since this attack have been consistently negative.

It has been asserted, with reason, that whereas artificial immunity to diphtheria is known to endure as a rule for several years at least, the permanence of immunity to scarlet fever similarly acquired—or, more correctly perhaps, the permanence of the Dick-negative state—is not nearly so assured. A difficulty, still only partially overcome, which underlies the specific control of scarlet fever is the standardisation of the toxin; for the accuracy which is possible in preparing diphtheria toxin is as yet unattainable for scarlet fever. In the early days, the toxin content of the skin-test doses used by different observers might, and did, differ widely. Thus the multiples of these doses used for active immunisation, although numerically identical, had not necessarily the same toxin content. Allowing for these variations in the skin-test dose of a batch of toxin, arrived at by trial and error upon human volunteers, the early workers were rightly cautious, and injected an aggregate of skin-test doses which in the light of subsequent experience was evidently far too small to ensure solid immunity. This should be remembered when comparing or assessing the older observations. Thus, whereas the final injection might formerly consist of, say 20,000 s.t.d. at most, the DICKS[2] now begin with 500 s.t.d. and increase steadily up to 80,000 or 100,000 in the fifth and last injection. With such a range they claim to produce active immunity to Dick-negative level in 95 per cent. of susceptibles and to modify considerably the susceptibility of the remainder. The duration as well as the degree of active immunity depends, they say, upon the amount of toxin injected. Retests at intervals of 1, 2, 3, 5, and 6 years indicated that more than 90 per cent. of those immunised to the point of an entirely negative test retain their immunity; from 5 to 9 per cent. "slip back and require a second immunisation." The relapse rate amongst primary negative Dick-reactors is negligible. HENRY records that retests in March of this year of 155 children who gave a primary negative test in 1932–34 showed only 1 doubtful change from negative to positive. Retests of 159 children immunised in 1933 showed that 5 had relapsed.

It is true that in this country scarlet fever is at present very mild. As noted on another page, for the first time since weekly returns were started a week has passed without the reporting of a death from scarlet fever in the aggregate of great towns. Nevertheless, in terms of loss of school attendance and occupation of beds in fever hospitals it is very expensive to the community. It is because of an insistent public demand that so many cases are sent to hospital; were some of this insistence directed towards active immunisation, there would be a notable drop in public expenditure on the disease.

[2] Dick, G. F., and Dick, G. H.: Edin. Med. Jour., 1934, xli., 1.

MEDICAL ASSESSORS

A WRITER in the *Law Journal* of Sept. 14th asks how it has come about that the High Court judges can never obtain the assistance of medical assessors in trials involving questions of medicine or surgery whereas county court judges can in certain cases do so. He goes on to say that he is definitely convinced that, in order to prevent frequent and serious miscarriages of justice, it is essential that machinery should be officially created whereby a medical assessor can be brought into a High Court case either on the application of one of the parties or on the initiative of the judge. The writer, presumably a member of the legal rather than the medical profession, supports his opinion by instances from his own experience. The views he expresses are of considerable interest. He makes the point that the average medical practitioner does not easily adapt himself to the conditions of the witness-box. The habitual medical witness—the police surgeon, for instance, or the expert consultant—may have become

acclimatised, but the other members of the medical profession sometimes become nervous and confused under cross-examination. Counsel, either having acquired some acquaintance with technical matters in previous cases or having been coached by experts, sometimes bring out and emphasise fallacious and meretricious points with the result that the inexpert mind of the juror is misled and inflamed. Members of the jury, continues the writer from whom we quote, are unable to distinguish between the authority of one medical witness and another; "an F.R.C.S. and an L.S.A. are equally doctors and experts." The article concludes by urging that either the High Court judges should have the services of medical assessors or else there should be "medical courts" to try issues of a medical or surgical nature just as there are admiralty or commercial courts to try nautical and commercial cases. Just as these latter courts are presided over by judges who possess special qualifications, so the medical courts would require judges who had something of the technical knowledge concerned. The late Lord FINLAY is mentioned as having possessed the medical qualification; no one is indicated as being similarly qualified among present occupants of the bench.

Since the writer in the *Law Journal* finds this omission in our judicial system, he must mean that the courts do not use the powers which they possess. He makes a brief mention of Order XXXVIIA of the rules of the Supreme Court whereby a "court expert" may be appointed in non-jury actions; the expert is appointed to inquire and report upon any question of fact or opinion which is not a question of law or construction, and his report can receive such weight as the court thinks fit. Under Section 98 of the Supreme Court Act of 1925 the court may in any non-criminal case before the High Court or Court of Appeal "call in the aid of one or more assessors specially qualified and try and hear the cause or matter wholly or partially with their assistance." Under Section 89 also, if a case requires scientific investigation which cannot conveniently be made before a jury, the question in dispute can be remitted to a special referee or arbitrator. How often, one wonders, has this statutory power been exercised so as to obtain the guidance of an expert in medicine or surgery in the decision of technical issues?

THE HISTOLOGY OF CUSHING'S SYNDROME

IT is now generally accepted that the peculiar clinical picture known as Cushing's syndrome or pituitary basophilism may be associated with a basophil adenoma of the anterior lobe of the pituitary gland, with a tumour or hyperplasia of the suprarenal cortex, or with a tumour of the thymus. It has been assumed in many quarters that the clinical features of the condition are the outcome of an overactivity of the basophil cells of the pituitary, but this assumption may be challenged on the ground that, in many cases where the primary anatomical lesion has occupied either the suprarenals or the thymus, the pituitary gland when examined by serial sections has been described as normal. In the case recently reported in our columns by HARE, ROSS, and CROOKE,[1] in which the syndrome was associated with a carcinoma of the suprarenal cortex, the pituitary gland, examined by A. C. CROOKE, was found to be peculiar in that the cytoplasm of the basophil cells in many places showed a partial or complete replacement of its granules by hyaline material. CROOKE now states [2] that he has found this change to be constant in the pituitary glands of 12 examples of Cushing's syndrome. His series included 6 cases of basophil adenoma, 3 cases of thymic tumour, and 3 cases of tumour or hyperplasia of the suprarenal cortex. No comparable degree of change was found in the basophil cells in a control of 350 serially sectioned glands obtained from autopsies. It is of interest that in this control series one example of an adenoma composed of ripe basophil cells was disclosed in a man of 66 who showed none of the clinical features of Cushing's syndrome. In this gland the basophil cells were free from the hyaline change.

Analysis showed that the hyaline change was the only abnormality in the endocrine system common to all examples of the syndrome. It was a constant and conspicuous feature of the pituitary gland throughout CROOKE'S series of 12 cases. The nature of the change is, however, by no means clear. There is no histological evidence that it is a result of cell degeneration or of post-mortem change; nor is there any evidence of abnormal proliferation amongst the basophil cells. A differential cell count of the cells in the anterior lobe in the case reported by HARE, ROSS, and CROOKE showed no abnormality in the numerical proportions of the three types of cell present, although a differential count made by A. H. T. ROBB-SMITH in a similar case reported by him jointly with F. G. LESCHER,[3] yielded an abnormally large proportion of basophil cells. R. M. CALDER and F. W. PORRO have recently described another case [4]; they found no evidence of an increase in the number of basophil cells in the pituitary gland, which they describe as normal. They did not, however, carry out a differential count. There is therefore no evidence of proliferative activity of the basophil cells, and at present it is impossible to estimate whether CROOKE'S hyaline change provides evidence, as he suggests, of an altered physiological activity or whether it is explainable on other grounds.

Sir Henry Dale will deliver the Harveian Oration before the Royal College of Physicians of London on St. Luke's Day, Oct. 18th, at 4 P.M. The title of his oration is Some Epochs in Medical Research. The Harveian commemoration dinner will be held in the College at 7.30 on the same evening, and the annual sermon will be preached at 11 A.M. at the church of St. Mary-le-Bow, Cheapside.

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[1] THE LANCET, 1935, ii., 118.
[2] Jour. Path. and Bact., 1935, xli., 339.
[3] Quart. Jour. Med., 1935, iv., 23.
[4] Bull. Johns Hopkins Hosp., 1935, lvii., 99.

ANNOTATIONS

SMOLLETT ON SPAS

Sir William Osler once remarked, with an eye to the weather, that England might well be interested in the study of water. In former years the medical profession was perhaps more interested than it is now. The Institute of the History of Medicine has issued at Baltimore [1] a reproduction of Smollett's "Essay on the External Use of Water," first published in London in 1752, together with an illuminating introduction by Mr. Claude E. Jones, who has added some textual notes and a bibliography. Tobias Smollett in his day was well acquainted with the spas in this and other countries. In his last novel, "The Expedition of Humphry Clinker" (1771), he describes his own treatment at Bath and his flying visit to Harrogate, then in a vigorous infancy. We know he also visited the Riviera and Aix-les-Bains, and the baths of Lucca in Italy. He emphatically commends the new practice of sea bathing in the cumbersome "machines" just introduced at Scarborough, Weymouth, and Margate. Smollett held that many conditions of feeble and depressed health were benefited by judicious sea baths and even acute ailments could now and then be given a favourable turn. Thus he relates that in middle life, on catching cold whilst at Boulogne, he

> "hired a chaise and, going to the beach about a league from the town, plunged into the sea without hesitation. By this desperate remedy I got a fresh cold in my head, but my stitches and fever vanished the very first day, and by a daily repetition of the bath I have diminished my cough, strengthened my body, and recovered my spirits."

And in another place Smollett remarks:

> "I am persuaded that all valetudinarians are too sedentary, too regular, and too cautious. We should sometimes increase the motion of the machine to *unclog the wheels* of life. . . . . I have found a change of company as well as a change of air to promote a vigorous circulation of the spirits, which is the very essence and criterion of good health."

It is a curious reflection that whilst the practice of medicine has undergone a complete revolution in most of its branches, physical medicine at the spas and seaside remains much the same as it was in Smollett's time. The fashionable vogue of the spas as social centres has a little declined, and they are now not so democratic as in the old days when all classes, even in a time of rigid class distinction, mingled freely at the springs and even in the assemblies and bathing pools. If they have lost something in fashion, the spas have not lost anything in popular estimation. Faith in waters and external applications and the resort to these natural remedies, as these and other physical means for the cure of chronic ailments have been called, have certainly not diminished. The recourse to remedies of this kind is rapidly increasing in some directions, but the academic recognition and teaching of the elements of physical practice, notwithstanding their popular importance, still remains as phantasmal as it was 200 years ago. True it is that the psychological factor in chronic diseases is now generally acknowledged; at the best health resorts it is wisely provided for by change of scene, opportunities for rest, exercise, and diversions and entertainments of various kinds, more or less helpful. Medical authority has indeed inclined at times to attribute the undoubted benefits of the health resort entirely to mental impressions. But in his handling of chronic disease the wise physician cannot disregard either the mental or the physical side of illness. Consciously or not, he must habitually employ two categories of remedies; and at the health resort physical and mental impressions, so far from being at variance, support and confirm one another. It is one of the worst of present-day medical heresies to dissociate these two categories of remedies.

Knowledge of the external uses of water since Smollett's day was advanced by Winternitz and his pupils, who more than half a century ago established the bases, as these appeared to them, of modern hydrotherapy. It is mainly due to their investigations in Central Europe that this practice has been carried further on the continent than in England. A more recent and equally notable advance has been the increased "feeling for the sea" in the twentieth century. On the continent this has been associated with research in medical climatology, that is to say, the effects of climate—the great assemblage of physical agencies—upon life in health and disease. The foundation of bioclimatic institutes in Germany, France, Switzerland, and Czechoslovakia is evidence of the importance attached to this new study. In England medical interest is still mainly concentrated on artificial applications. Meanwhile the annual migration from the towns to the coast may be counted in millions, facilities for bathing in the open sea and in sheltered pools have been everywhere increased, and a new horizon is opening for the seaside resorts as national centres of health and convalescence. Herein lies, on a greater scale than at the spas, an opportunity for medical guidance based upon precise knowledge. It would be better for medicine to put itself into a position to lead than to follow the instinctive movements of popular practice.

[1] Baltimore: The Johns Hopkins Press, 1935, pp. 82, 4s. 6d.

X RAY DIAGNOSIS OF BREAST TUMOURS

ATTEMPTS to diagnose the nature of tumours of the breast by radiograms taken in such a way as to show the structure of the soft tissues has reached a stage which merits attention. Ritvo and his coworkers, who have made X ray examinations of the breast in 320 cases during the past three years, believe [1] that it is possible to determine the presence of a pathological process with a high degree of accuracy by this method. The technique requires no previous preparation of the patient, who suffers no discomfort. She lies in such a position that the central X ray beam may pass through the breast to the film without striking the ribs. The upper arm of the side being examined is placed at right angles to the body with the forearm alongside the head, palm upward. The opposite breast is drawn back and held against the chest wall by the free hand or by adhesive tape. The Bucky diaphragm, the stereoscopic method, and double intensifying screens must be used if the required detail is to be obtained. The authors claim that they can show the anatomy of the normal breast and detect the presence of simple adenoma, mazoplasia, cystic disease, and malignant tumours, but they are not able to distinguish malignancy in its early stages, particularly when it occurs as an infiltrative change in already hypertrophied tissues. The

[1] Ritvo, M., Butler, P. F., and O'Neil, E. E.: Jour. Amer. Med. Assoc., August 3rd, 1935, p. 343.

radiograms may however show points of great importance in suspected malignant conditions—e.g., the presence of encapsulation and of metastases in the axilla. The detection of metastases in rib is mentioned, but these must be rare in cases which still present any difficulty in diagnosis. It is claimed that X ray examination gives information which would in its absence be obtained by repeated palpation, a procedure believed by many to involve the risk of disseminating malignant cells in the lymphatics. Even though the diagnosis of malignancy at a really early stage remains unsurmountable without histological examination, in doubtful cases X ray examination may offer some support to a diagnosis, positive or negative, founded on clinical signs. In women over forty, moreover, the presence of well-marked mazoplasia or cystic disease is in any case coming to be regarded as an indication for local amputation, and radiological evidence that such a condition is actually present allows the clinician to advise operation with more confidence. In cases of abscess of the breast it may be useful to ascertain the size and extent of the lesion. In malignant tumours the demonstration of axillary metastases at a palpable stage must lead to careful consideration of the rival claims of operation and radiotherapy. It follows that even in cases where the diagnosis is not in doubt there is something to be said for investigation of the tumour by X rays. The reproductions of the radiograms selected by Ritvo and his colleagues to illustrate their article suggest, however, that their interpretation may be a difficult matter even for the expert.

THE COURSE OF RHEUMATIC HEART DISEASE

THE natural history of a chronic disease such as rheumatic fever is difficult to ascertain with any precision. It is known to be a disease of which the initial manifestations occur mostly among schoolchildren or young adults, and to leave permanent cardiac lesions which shorten life. The only way to determine the common course of the disease is by following a large number of cases from initial infection to death, an arduous task which has been accomplished by A. C. De Graff and C. Ling,[1] working in New York. They noted in a group of 644 patients the average ages of onset of important phases of the disease, notably initial infection, 17 years; first symptoms of cardiac insufficiency, 28 years; first appearance of heart failure, 30 years; death, 33 years. Thus the average patient had an economic life of only 11 years—the period between first infection at 17, and the first symptom of diminished circulatory reserve at 28.

The records of this same group of 644 patients were analysed to discover how the course was affected, if at all, by the various valve lesions. The effects proved to be slight; but in the presence of tricuspid or pulmonary lesions, and also with isolated mitral insufficiency, the outlook was slightly less favourable than with other valve lesions. The addition of aortic incompetence to mitral stenosis had no effect on prognosis as compared with mitral stenosis alone, though cases of aortic lesions alone were at a slight disadvantage in comparison with mitral stenosis. The incidence of congestive cardiac failure was high, being higher the greater the number of valves affected; with aortic lesions alone, more than one-third of the patients escaped it. The conclusion drawn from these results is that valve lesions are of very little importance in prognosis. De Graff and Ling have also tried to estimate the influence of auricular fibrillation on the course of rheumatic heart disease. Among these 644 fatal cases this arrhythmia had occurred in 43 per cent., and a comparison of the cases with and without fibrillation is interpreted as showing the irregularity, per se, to have no effect on prognosis. It is a complication of a late stage of the disease, and when it shows itself the course of the disease is nearly run. According to this view auricular fibrillation is the result of long-standing cardiac lesions, but does not cause any further appreciable impairment of the circulation.

[1] Amer. Heart Jour., 1935, x., 459 and 630.

PYURIA IN CHILDHOOD

THE apparent increase in the incidence of pyelitis in childhood is a phenomenon which many experienced physicians have observed without being able to explain. E. Holzmann[1] has recently made some observations which may provide a clue. Though pyuria is not usually considered to have any close association with infections of the upper respiratory tract, the part played by tonsillar disease in the ætiology of nephritis is clearly recognised. Droplet infection of the upper respiratory tract is regarded as the most important source of disease in childhood. Holzmann records instances of pyuria definitely associated with acute tonsillitis, and also reports one case in a girl of 6 years where removal of the tonsils caused the prompt disappearance of a chronic pyuria. He also comments upon the duration of attacks of pyuria, claiming to have collected evidence in support of the theory of a seven-day cycle. In children the tendency for a febrile illness associated with pyuria to come to an end on the seventh, fourteenth, twenty-first, or twenty-eighth day of illness has, according to this view, to be considered before any special medicament is given the credit for effecting a cure. Throughout Holzmann's paper he is careful to use the term "pyuria" without any closer designation of the underlying pathological process present, and he does not indicate the amount of pus in the urine that would in his opinion justify the diagnosis. A. B. Helper and R. T. Scott have recently[2] set out to determine what constitutes a pyuria of clinical importance, and what is its significance when it is encountered in an ordinary routine examination. They have investigated the urine of all children on their admission to an orthopædic hospital over a period of nine months; a voided specimen of urine was examined both before and after centrifuging. If there was pus in any appreciable amount the patient was catheterised and the urine again examined before and after being centrifuged. If pus was then found a full investigation of the genito-urinary system was then carried out. Nearly 700 children came under review, and the first fact of importance discovered was that pus cells could be demonstrated in 99 per cent. of the ordinary voided specimens of urine after this had been centrifuged. Catheterisation reduced this number to 13 per cent. Altogether 66 children were detected by this means as having pyuria in need of a fuller examination; 26 of them were found to have disease of the urinary tract such as hydronephrosis, congenital valve of the urethra, and neuromuscular incoördination of the bladder mechanism; 13 of these having pus cells in the urine only in amounts well under what is quoted in the literature as a "normal" pus content. It is suggested therefore by Helper and Scott that the amount of pus present is no guide as to the necessity for cystoscopy or other forms of examination. In children with similar

[1] Deut. med. Woch., August 23rd, 1935, p. 1352.
[2] Jour. Amer. Med. Assoc., August 17th, 1935, p. 499.

lesions, counts per high-power field in dry preparations varied between 1 and 20. Since many of the congenital anomalies of the urinary tract are "silent" in the early phases it is urged that it is a greater error to ignore a few pus cells in the urine than to submit a child with such a slight degree of pyuria to an unnecessary series of tests. The study also serves to emphasise the need for catheterisation before any real significance can be attached to the presence of pus cells in the urine. Even in boys, after thorough cleaning of the glans and prepuce, evidence of contamination was encountered. It is also clear that much of the disagreement in the literature as to what may be regarded as the normal number of leucocytes or pus cells in the urine is due to varying methods of collecting and examining specimens. Pending agreement upon what constitutes a pyuria the main deduction to be drawn from the study by Helper and Scott seems to be that the presence of even a few pus cells calls for careful scrutiny of the whole clinical picture.

TEST FOR THE COMPETENCE OF THE LUNGS

No surgeon would think of removing a kidney without first satisfying himself of the efficiency of the one he would leave behind. The increasing popularity of artificial pneumothorax and the more permanent ways of producing pulmonary collapse are directing attention towards the functional efficiency of the lungs. Bronchial spirometry,[1] however, which is similar in principle to catheterisation of the ureters, has not yet found practical application in this country, largely because of its technical difficulties. In looking for an alternative means of measuring respiratory efficiency Dr. Bluhm, of Söderby Hospital, Sweden, has considered both basal metabolic rate and blood circulation through the lungs; but the former he finds to be unaltered in patients with pulmonary tuberculosis, even in the presence of a slightly raised temperature or after unilateral or bilateral collapse, while the latter is affected only by gross destruction of pulmonary tissue and not by pneumothorax or thoracoplasty. The "working test" for pulmonary efficiency, which he describes in a monograph[2] depends on the comparison of oxygen-consumption at rest with oxygen-consumption after the performance of a standard amount of work, and is based on the technique which Nylin has used for testing cardiac function.[3] The subject of the experiment ascends flights of steps placed in a circle for 20 rounds (occasionally only 10), the rate of walking being fixed by a metronome at 88 steps a minute. The relative oxygen-debt (Leonard Hill) is equivalent to the increase per minute in oxygen-consumption following the period of work. Normal persons sometimes show little or no increase, but most results lie between 10 and 25 per cent. Bluhm's pathological material consisted of 102 patients on whom 411 determinations were made; the vital capacity of each was also taken, but it showed little or no correlation with the functional test. The first group of tuberculosis patients comprised those not treated by any form of collapse therapy: the majority showed a normal oxygen-debt; some gave higher figures and a good correlation was established between the oxygen-debt and the amount of lung tissue involved. Exudative cases on the whole showed better functional efficiency than productive ones. In the second group consisting of pneumothorax cases it was found that when a considerable amount of lung tissue was put out of action the oxygen-debt tended to reach higher values, especially when the pre-existing disease of the lung had led to fibrotic changes. In such cases the functional efficiency of the lung is less after a refill than it was before. In general, insufficiency tends to appear in productive cases when pressures exceed plus 1 cm. of water, whilst in exudative cases plus 3 may be reached without any functional change. Altogether 77 per cent. of pneumothorax cases showed a raised oxygen-debt. The patients investigated included only 8 who underwent thoracoplasty and in only 4 of these were observations made both before and after treatment. Three cases of phrenic evulsion are also included, but the data are too scanty to justify any conclusions. Pleural effusion complicating pneumothorax was several times associated with a particularly high oxygen-debt; this is probably due partly to the increased collapse of the lung from the weight of the fluid and partly to fibrotic changes in the pleura spreading into the lung.

That this test for lung function may have practical value is suggested by the results of a follow-up of 38 cases which show a fairly close correlation between the results of the functional test and the subsequent capacity for work. The thoracoplasty cases are few in number but show that, although the vital capacity is greatly reduced by thoracoplasty, there may be a normal or only slightly increased oxygen-debt associated with full working capacity. If further experience confirmed the results described in Dr. Bluhm's monograph, we should have a useful adjuvant to clinical judgment in deciding on the advisability of surgical collapse. Oxygen-debt, however, depends essentially on muscle metabolism and slow changes in the blood, so that it is doubtful whether it really bears any relation to pulmonary efficiency. Hence it would have been useful to have observations on controls with various disorders of the heart and lungs. A further objection to the test is that it cannot be used for people who are confined to bed.

[1] See THE LANCET, 1933, i., 481; 1935, i., 989.
[2] Bluhm, I. L.: Working Test as Clinical Method for Determining the Function of the Lungs. Acta Med. Scandinavica. Suppl. lxv. Stockholm. 1935. Pp. 209.
[3] Acta Med. Scandinavica. 1933. Suppl. lii.; see THE LANCET, 1933, ii., 369.

CYCLOPROPANE

THE latest account of cyclopropane strengthens the good opinion that has been formed of this new gaseous anæsthetic. Writing from the Lahey Clinic at Boston the authors[1] record only 184 inhalations but are able to provide much instructive information, including an important warning that "in using cyclopropane, where we know that the anæsthetic mixture is not only inflammable but explosive as well," particularly searching care should be taken. They think the special value of the gas lies in its application to thoracic surgery, and of their 184 operations no less than 124 were on the chest. A carbon dioxide absorption technique is of course regarded as essential for the use of cyclopropane in practice, and with this method they have maintained surgical anæsthesia at the rate of about a gallon an hour. This brings the gas within reasonable limits of expense. The utmost care is needed to avoid leakage by making the face-piece really air-tight. Cyclopropane is solvent for rubber and rubber compounds; hence the pin type of valve is best adapted to the use of this gas. The solvent action however is not manifest in concentrations low enough to be within the anæsthetic range, and ordinary tubing and breathing bags, and even flutter

[1] Sise, L. F., Woodbridge, P. D., and Eversole, U. H.: New Eng. Jour. Med., August 15th, 1935, p. 303.

valves of rubber, can apparently be retained without suffering damage. It is pointed out that "those who begin the use of cyclopropane should bear constantly in mind its great power and its rapidity of action. The effects of higher concentrations are simply astounding and are unbelievable to those who think in terms of the weaker gases, nitrous oxide and ethylene. With these our chief warning comes from signs of anoxæmia. With cyclopropane on the other hand drastic overdosage takes place in the presence of abundant oxygen." At the Lahey Clinic it is held preferable to omit all premedication except morphine gr. $\frac{1}{8}$ and scopolamine gr. 1/100–1/150. Cyclopropane is considered a valuable agent because it combines low toxicity with fairly powerful anæsthetic action. It is obviously an agent whose use requires learning, even by the man experienced with other anæsthetics.

RECENT WORK ON SPERMICIDES

Kölliker's classic work on the physiology of the seminal fluid, which included a study of the way in which the movements of sperms may be influenced by chemicals was published in 1856.[1] Fifty years later Gunther[2] wrote a paper on sperm poisons. Since then until quite recently, little systematic work would appear to have been done on spermicides. Results of tests have been published from time to time in Germany, America, Japan, Russia, and this country by such workers as W. Steinhäuser, M. Rodecurt Helen Holt, S. Uchigaki, C. I. B. Voge, and J. R. Baker, but, with the exception of Baker, none of these workers has made anything like a systematic study of the spermicidal power of pure substances, nor has an attempt been made to evolve satisfactory laboratory tests that make it possible to compare the spermicidal power of any one pure substance or commercial product with that of any other. A clinical test would be best, but this is not feasible owing to the large number of unknown factors involved. Dr. Baker has been working on chemical contraceptives under the auspices of the Birth Control Investigation Committee, and he has recently described his investigations in a lecture delivered before the Eugenics Society reported in the *Eugenics Review* for July, 1935 (p. 127). He has been at great pains to perfect his technique and to make the conditions under which substances are tested approach as nearly as possible to those under which they would be acting in vivo without sacrificing scientific accuracy. Details of the tests have been published in the *Journal of Hygiene* during the last few years, the last article appearing in the January 1935 issue. He has also tried to discover a harmless chemical contraceptive more efficient than those on the market. Among his observations is that sperms, from species as far distant from each other phylogenetically as the sea urchin, the guinea-pig, and man, react in an almost identical manner to the same chemicals. Rather surprisingly the only inorganic salt which he has found with a high spermicidal power is mercuric chloride with a killing concentration of 1/256 per cent. Acids he describes as weak spermicides, and he points out that, contrary to common belief, substances which are strongly germicidal are not necessarily strong spermicides, and vice versa. No alkaloid tested by him has proved to be a good spermicide; in fact strychnine hydrochloride in certain concentrations has a stimulating effect on the activity of sperms. The most highly spermicidal substances that he has so far discovered have been aldehydes, phenols, and quinones, the four most spermicidal all being quinones, with toluquinone heading the list with a killing concentration of 1/512 per cent. When one compares this with quinine or chinosol, which can only claim a killing concentration of $\frac{1}{2}$–$\frac{1}{4}$ per cent., it is astonishing that these chemicals have for so long been popular among manufacturers of chemical contraceptives. Dr. Baker emphasises the need to put any possible spermicide through stringent tests for harmlessness, a slow but essential process, before it can even be considered for clinical trial. Dr. Carleton is doing this important part of the work at Oxford. He uses the bitch as his experimental animal and places a known quantity of the substance to be tested into the vagina every day for 28 days. After this the animal is killed and the vagina examined macro- and microscopically for any sign of infiltration or damage to the epithelium. Dr. Baker notes that he and his wife while in the New Hebrides came across some herbal preparations used by the native women, who claimed that certain plants growing on the islands when taken by mouth acted either as contraceptives, temporary sterilisers, permanent sterilisers, or abortifacients. They succeeded in obtaining the seeds of some of these plants and brought them to England where they are being grown under suitable conditions and will be tested on mice.

[1] Zeitschrift für Wissenschaftliche Zoologie, 1856, vii., 201–81.
[2] Arch. ges. Physiol. (Pflügers), 1907, cxviii., 551–71.

WEEK-END POST-GRADUATE COURSES

WEEK-END post-graduate courses at or near the opening of the autumn session of the London medical schools are now firmly established as an annual event. The scheme originated at St. Mary's Hospital in 1922, was an immediate success, and after a year or two was gradually adopted by other teaching hospitals. We observed 12 years ago,[1] when reporting the second week-end course to be held at St. Mary's, that the general adoption of a scheme of this sort might go some way to meet the reproach that the London medical schools have little to offer the former student. This year 8 of the 12 schools are providing week-end courses in September, October, or November, 3 of the courses being open to all medical practitioners and 5 confined to former students. Of the remaining 4, St. Thomas's and St. George's organised such courses in the autumns of 1932, 1933, and 1934, and St. Bart.'s again had a successful mid-week course (three days) in June, 1935, this timing having proved popular in recent years. Guy's seems to be the only London school to have consistently resisted the prevalent custom of providing annual refresher courses of brief duration. Although the necessarily intensive and high-speed nature of these courses suggests, as Dr. Robert Hutchison once said, a continuous variety programme, and may conduce to mental indigestion, there can be no doubt of their popularity with the general practitioner for whom they are primarily intended. The subjects of the lectures given during the last few years afford an interesting index of what, in the opinion of the teaching staffs of the great hospitals, are at the moment matters of importance to those engaged in general practice. It must, of course, be remembered that the mere titles of lectures in any course do not necessarily provide an adequate conspectus of its content. Many lecturers prefer the discursive method, dwelling on problems and pitfalls in diagnosis or treatment rather than on one or another aspect of any particular disease. Moreover, some of the teaching is given by means of demonstrations at the

[1] THE LANCET, 1922, ii., 805.

bedside, in the operating theatre, or elsewhere, though, unfortunately, the very popularity of the courses must limit the amount of intimate or informal instruction.

Between 1931 and 1934 only five lectures on psychiatrical topics have been given in these courses. In view of our increasing knowledge of mental disorder and the changed outlook on its problems, it is to be hoped that in future years this subject may receive much more attention. The practitioner realises more and more how largely the psychological element bulks in his work and how it may colour or even dominate the picture in cases of undoubted organic disease. Pædiatrics has been given a larger share, with some 14 lectures, including two on acidosis. Radium therapy has been thoroughly discussed and demonstrated and the increasing importance of radiology in diagnosis has been suitably stressed. In addition to numerous demonstrations of new methods of anæsthesia there have been several lectures on the use of new agents, such as Evipan. There have been ten lectures on dermatology. Eczema has been chosen as a subject more than once, possibly because it provides a good excuse for a broad and generally informative survey of skin lesions. "Itching" received a lecture to itself one year, and the medico-legal position of dermatology has been ventilated under the heading Dermatitis and Compensation. Another ten lectures were devoted to pathology, using that term in its widest sense. The new work on filtrable viruses and the serum prophylaxis of virus diseases, a matter of urgent clinical importance to the practitioner, have been clearly explained. More than 30 lectures have been given on obstetrics and gynæcology. Many of the aspects chosen have been conventional—uterine inertia, prolapse, hæmorrhagia, toxæmias of pregnancy, and so forth; contraception was the subject chosen for two lectures, and the Aschheim-Zondek test has been described at least once. There was one lecture on sterility, but we have no record of any discussion of the pros and cons of eugenic sterilisation which easily deserved a place. Teeth and dental sepsis in relation to medicine and surgery provided two lectures, and venereal disease four. Turning to general surgery, we find some 77 titles which could be classified under this heading. Prostatic disease, from one aspect or another, has been chosen on 6 occasions and 6 lectures have also been devoted to general or special fractures. Other favoured subjects have been thoracic surgery (4), the surgery of the sympathetic (4), and varicose veins (3). There are no notable omissions in this sphere and the important new developments in neuro-surgery have not been neglected. The surgery of the special departments has also received a reasonable share of attention, mainly on general lines. On ophthalmology there have been 7 lectures, including only one on conjunctivitis and iritis, and in one of the 11 lectures on oto-rhino-laryngology, naso-pharyngeal sepsis in relation to chronic bronchitis and emphysema was discussed. There have been 7 lectures on neurological and nearly 100 on general medical topics. Of the latter, the favourites appear to have been toxic goitre, unexplained pyrexia (a hardy annual), the anæmias, diabetes, nephritis, pulmonary tuberculosis, and dietetics. Nobody will quarrel with any of these, but it may have been a little depressing to practitioners that only 3 of these 100 lectures were devoted solely to the subject of treatment. Endocrinology, also, surely deserved more than 2 lectures and allergy more than one.

A week-end is certainly too short a time to do much more than renew old contacts, but the stimulation that such contacts have afforded and the realisation that certain theoretical advances have an unsuspected practical bearing, have certainly brought to many doctors, senior as well as junior, a refreshment which has lent a renewed interest to their daily work. Some of the lectures in this year's courses, of which particulars are set out week by week in our Medical Diary, will be summarised in THE LANCET, three of them in our present issue. It is clear that all those responsible for drawing up the programmes for these quite independent courses have tried to put their audiences into touch with recent work without forgetting that "common things are common," and therefore deserving of attention.

SPAHLINGER BOVINE VACCINE

HOPE deferred was making the heart very sick about the Spahlinger human remedies some four years ago, but it was then reported that calves on a Norfolk farm had been successfully immunised with a single dose of simplified bovine vaccine provided by Mr. Spahlinger. At that time veterinary surgeons were satisfied that the vaccine had conferred on calves a high degree of resistance against tuberculosis. A little later a test was begun in Northern Ireland under the direction of the Ministry of Agriculture, using a bovine vaccine prepared according to a method described by Mr. Spahlinger in our own columns (THE LANCET, 1932, i., 309). A number of calves which had passed the double intradermal test were divided into two groups, of which one was vaccinated by Mr. Spahlinger himself in December, 1931, with this new bovine vaccine by various routes. A year later a report of the test by three veterinary surgeons attached to the Ministry of Agriculture in Belfast showed that all the vaccinated animals had remained clinically healthy after receiving a dose of tubercle bacilli which killed the majority of the controls within two months. A final report by the same officers on this interesting experiment was issued by the Government of Northern Ireland on Tuesday, from which it appears that eleven vaccinated calves resisted the injection of the test dose of tubercle bacilli in a very similar manner. One animal weakened by nematode infection died of tuberculous meningitis after 607 days. The other ten animals, which remained perfectly well, were slaughtered in the municipal abattoir 780 to 892 days after injection of the test dose. One of them was found to have a tuberculous udder. Post-mortem examination revealed the presence of nodules in the lungs and certain glands; when incised these were found to contain an oily pus-like or cheese-like substance in which tubercle bacilli were not demonstrable by the microscope although injection of the material into guinea-pigs showed the presence of viable tubercle bacilli. These vaccinated animals had also been exposed for two years to the risk of natural infection and the heifers were put to the strain of calving and lactation. In a foreword to the report, the secretary to the Ministry points out that the highly satisfactory nature of the results raises the question of the compulsory use of the vaccine as a means of eradicating bovine tubercle from the herds of Northern Ireland.

Prof. R. A. Fisher, F.R.S., will deliver two lectures on eugenics and national health at the London School of Hygiene and Tropical Medicine, Keppel-street, W.C., on Oct. 16th and 23rd, at 4.30 P.M. Prof. M. Greenwood, F.R.S., will take the chair at the first lecture.

PROGNOSIS

A Series of Signed Articles contributed by invitation

LXXI.—PROGNOSIS IN PAPILLOMA OF THE BLADDER

PAPILLOMA of the bladder, like papilloma elsewhere in the body, must be regarded as a precancerous growth which is only too likely to become malignant if left untreated. Hospital statistics appear to indicate that the disease is on the increase, but the truth probably lies in the fact that the more frequent use of the cystoscope in cases of hæmaturia has led to accurate and earlier diagnosis. It is not possible to give a prognosis which is applicable to all cases, for it depends on the number of growths, their character, their size, their situation, and the age of the patient, but it can be stated quite definitely that though the recurrence-rate at the present time is high, the prognosis as regards life is good *provided* the patient submits to cystoscopic examination at regular intervals during a period which in the writer's experience cannot be definitely fixed but which should never be less than three years.

In a series of 97 cases which have been kept under careful personal observation the recurrences have been as high as 50 per cent. Many of these patients have been examined at regular intervals for from 10 to 15 years, during which time there have been recurrences in some almost yearly and in others at intervals of one or more years.

The following examples from this series point to the danger of too optimistic an outlook as regards freedom from recurrence, and to the necessity of regular examination over a long period.

	Sex and age.	
A. B. ..	M. 48	.. Frequent recurrences 3 yrs.; free 3 yrs.; one recurrence 7th yr.; free 3 yrs.
C. D. ..	F. 34	.. Frequent recurrences 1st yr.; free 2nd yr.; recurrences 3rd, 4th, 5th, and 6th yrs.; free 7th yr.; recurrence 8th yr.; free 9th to 12th yrs.
E. F. ..	F. 74	.. Frequent recurrences 1st yr.; free 2nd yr.; recurrence 3rd yr.; free 4th, 5th, and 6th yrs.; recurrence 7th yr.; free 8th yr.; recurrence 9th and 10th yrs.
G. H. ..	M. 55	.. Free 7 yrs.; recurrence 8th yr.; free 9th, 10th, 11th, 12th yrs.; recurrence 13th yr.; free 14th yr.; recurrence 15th yr.; free 16th and 17th yrs.; recurrence 18th and 19th yrs.; free 20th, 21st, and 22nd yrs.; recurrence 23rd yr.
I. J. ..	M. 61	.. Recurrence 2nd yr.; free 5 yrs.; recurrence 8th, 9th, and 10th yrs.; free 11th yr.
K. L. ..	M. 42	.. Free 2 yrs.; recurrence 3rd yr.; free 4th yr.; recurrence 5th yr.; free 6th yr.; recurrence 7th and 8th yrs.; free 9th and 10th yrs.; recurrence 11th yr.

In three of the above the original operation was transvesical and in three perurethral, so that as far as these particular cases are concerned the method does not seem to have affected the result.

The primary growths are usually on the base of the bladder and close to the ureteric orifices; they seldom occur on the trigone. Recurrences after open operation are often in the region of the scar and in all cases are common in the paratrigonal region and occasionally at the internal meatus. In the latter situation the prognosis as regards recurrence is worse, for the growths are liable to be overlooked and are difficult to treat by perurethral methods. When a growth is found on the lip of a ureteric orifice or when recurrences occur repeatedly around it, they should be regarded as possibly secondary to a primary growth in either the kidney or ureter, and every available means of diagnosis should be employed to ascertain if this is correct, for until the parent growth is removed the recurrences will continue and may spread with alarming rapidity. Also, the parent growth may become malignant while the recurrent growths in the bladder are still benign and are thought to be the sole cause of the hæmaturia. This happened in one of my cases in which a papilliferous carcinoma of the kidney, that probably commenced as a simple papilloma, gave rise to multiple benign papillomata of the ureter and bladder which recurred in the bladder so frequently and in such increasing numbers after ureterectomy, that eventually total cystectomy became necessary.

NUMBER AND SIZE OF GROWTHS

Small solitary growths, provided they cause symptoms which lead to their early detection, seldom give rise to troublesome recurrences as they can usually be destroyed by perurethral fulguration before "seeding" has commenced. Small multiple growths give rise to frequent recurrences, often over a long period, and one of the recurrent growths may become malignant at any time; or benign recurrences may multiply so rapidly as to fill the bladder and cause severe hæmorrhage and severe cystitis. In these cases the prognosis is naturally grave on account of the dangers of ascending infection, of malignancy, and of the surgical treatment (total cystectomy) that may be required. Large solitary growths are always serious, for in addition to their tendency to slough and cause troublesome cystitis they are more prone to become malignant. Further, as removal by the transvesical route is usually necessary, there is the added danger of graft recurrence both in the vesical scar and in the abdominal wall.

FORM OF GROWTH

Five distinct clinical forms are recognisable:—

(1) and (2) The pedunculated or the sessile types of growth with long delicate fronds. These are easily destroyed by perurethral fulguration and the outlook is good provided recurrences are kept in check by regular cystoscopic examinations.

(3) The flat papilloma composed of small compact villi looking like a patch of moss. This also is easily destroyed by diathermy, but if it recurs it should be regarded as malignant and excised.

(4) The growth with coarse tightly packed villi and a thick pedicle. This responds to diathermy less rapidly than (1) and (2), often requiring two or more applications at intervals of five or six weeks, for the slough is slow to separate. On this account it should be regarded as on the verge of malignancy and a guarded prognosis given.

(5) The prominent growth with a finely granular surface. The prognosis is serious, for even if the superficial part is benign the deep layers and base are always malignant.

AGE AS AFFECTING PROGNOSIS

Papillomata are seldom seen below the age of 20 and occur with greatest frequency between 40 and 60. In the young, hæmaturia is usually investigated with little delay, so that a growth if found is always small, generally single, and easily destroyed at one sitting. Recurrence is therefore far less frequent and the prognosis correspondingly good. In older patients hæmaturia is not invariably regarded as serious, being ascribed to "inflammation" of the kidneys, enlarged prostate, gravel, and so forth;

consequently investigation is often delayed for a considerable time, during which the papilloma is increasing in size, is "seeding" and advancing steadily towards malignancy. The prognosis is therefore more serious, for recurrences are more frequent and may at any time be malignant.

The prognosis of aniline tumours occurring in dye workers does not appear to be any different to that of the ordinary growth provided the patient changes his occupation; if he does not do so recurrences are more prone to be malignant.

METHOD OF TREATMENT

Provided the growth is not too large and its whole surface is accessible the best results are obtained by cystoscopic diathermy. This does not of course prevent recurrences, for "seedlings" or implantation growths, too minute to be seen by the naked eye, may be present when the first treatment is given. Recurrences are commonly in the neighbourhood of the original growth but may be anywhere in the bladder and even in the commencement of the prostatic urethra. Therefore at subsequent examinations it is important to inspect the neck of the bladder with a retrograde telescope after the vesical cavity has been examined with the ordinary instrument. When there has been hæmaturia and no growth is found in the vesical cavity the prostatic urethra should be inspected with a posterior urethroscope. In this context it is interesting to note that recurrent growths are unknown in any other portion of the urethra. When the primary growth, though not too large for successful cystoscopic diathermy, is large enough to require several treatments which are either irksome to or unbearable by the patient, an open operation may be considered preferable.

A transvesical operation is only a necessity, when the growth is either too large for cystoscopic diathermy, is not completely accessible, or when it is judged to be becoming malignant. The great disadvantage of an open operation is the danger of graft recurrences. It is estimated from the combined literature that the recurrence-rate after an open operation is 60 per cent. In my series it was 50 per cent. after the open operation and also 50 per cent. after perurethral fulguration. Recurrences are generally in the cystotomy scar where they can be dealt with by perurethral methods and therefore do not add materially to the gravity of the prognosis; but in a small proportion of cases grafts take root in the abdominal wall where they eventually become malignant. The graft may remain dormant for many years and then suddenly light up into a rapidly growing infiltrating carcinoma. This happened in two of my cases; in one 18 months after operation, and in the other after an interval of no less than nine years, when it grew at such a pace that in a few months practically the whole abdominal wall was infiltrated. It is therefore of the greatest importance to watch the patient carefully for several years after an open operation.

DANGER OF MALIGNANCY

Every papilloma of the bladder is a potential malignant growth and the danger of malignancy increases with the frequency of recurrences. In my series of 97 cases 9, or approximately 11 per cent., developed carcinoma; 7 within five years, 1 seven years, and 1 ten years after the first treatment. When the number of primary and recurrent growths these 97 cases must have had is taken into consideration 11 per cent. of malignancy does not seem a very high incidence, but it would undoubtedly have been higher had not the patients been examined at regular intervals, often for many years, and the recurrences kept in check.

AFTER-CARE

In a series of cases on which this article is based routine cystoscopic examinations were made at the following intervals:—

1st year	three monthly.
2nd year	six monthly.
3rd, 4th, and 5th years	yearly.

If at the end of this period there had been no recurrence the patient was discharged but told to watch the urine and to report immediately should any blood be seen. In the event of a recurrence at any time during the five-year period the routine examinations were recommenced.

There is little doubt that the outlook as regards both recurrence and malignancy depends on frequent and regular cystoscopic examination, for there may be as much as 12 to 18 months' interval between noticeable hæmorrhages, often the only symptom of the growth. This must be impressed on the patient and the necessity for frequent cystoscopic examination explained, otherwise he will very naturally disregard instructions until there is another attack of hæmaturia, by which time the growth may no longer be solitary and may have become malignant.

CYRIL A. R. NITCH, M.S., F.R.C.S.,
Senior Surgeon, St. Thomas's Hospital.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

Surg. Comdr. J. E. Clark to *Victory* for course, and to *President* for course; A. L. McDonnell to *Drake* for R.N.B.; and A. E. Phillips to *President* for course.

Surg. Comdr. A. B. Clark placed on the Retd. List at own request, with rank of Surg. Capt.

Surg. Lt.-Comdr. W. P. E. McIntyre to *Resolution*.

ROYAL NAVAL VOLUNTEER RESERVE

Surg. Lt. A. S. Pearson promoted to Surg. Lt.-Comdr.

Proby. Surg. Lt. A. I. L. Maitland to Haslar Hospital.

Proby. Surg. Sub-Lt. L. Foster to R.N. Hospital, Chatham.

ARMY MEDICAL SERVICES

Col. J. W. L. Scott, D.S.O., late R.A.M.C., K.H.P., from Asst. Dir.-Gen., to be Dep. Dir.-Gen., Army Med. Servs., War Office.

Col. F. Casement, D.S.O., late R.A.M.C., to be Asst. Dir.-Gen., Army Med. Servs., War Office.

Maj.-Gen. R. B. Ainsworth, C.B., D.S.O., O.B.E., late R.A.M.C., K.H.P., having attained the age for retirement, is placed on retd. pay.

Col. W. P. MacArthur, D.S.O., O.B.E., late R.A.M.C., K.H.P., to be Maj.-Gen.

Col. H. M. J. Perry, O.B.E., late R.A.M.C., K.H.S., to be Maj-Gen. (Supern.).

Lt.-Col. E. M. Middleton, O.B.E., from R.A.M.C., to be Col.

Royal Army Medical College: Maj. Gen. R. B. Ainsworth relinquishes the appt. of Comdt. and Dir. of Studies.

Maj.-Gen. W. P. MacArthur, from Dep. Dir.-Gen., Army Med. Servs., to be Comdt. and Dir. of Studies.

ROYAL ARMY MEDICAL CORPS

Short serv. commissions: Lt. F. J. O'Dowd to be Capt.

Lts. (on prob.) restd. to estabt.: J. J. Sullivan, M. Kosloff, and J. L. Gordon.

Maj. J. W. C. Stubbs, D.S.O., M.C., to be Lt.-Col.

REGULAR ARMY RESERVE OF OFFICERS

The undermentioned having attained the age limit of liability to recall, cease to belong to the Res. of Offr.:—

Col. M. H. Babington, D.S.O. (late R.A.M.C.).

Maj. J. A. Bennett.

(*Continued at foot of next page*)

SPECIAL ARTICLES

THE TRIPLE STRUCTURE OF MEDICINE *

BY WILFRED TROTTER, M.S., F.R.S.

THE constituents of which medicine is made up are readily discernible: they are three—a practical art, an applied science, and an experimental science.

MEDICINE AS A PRACTICAL ART

It is always readily agreed that medicine is an art. The indispensable task of defining precisely what that phrase means is, however, less frequently undertaken. Medicine is a practical art in the same sense as is the work of the farmer, the smith, or the joiner. When this primary stage of definition is reached it becomes clear that definite qualities and modes of activity must be possessed by this element in medicine. These are of great practical importance, and it is surprising that they have had little exact notice. Now that the prestige of science is so high the statement that a great part of medicine still retains the status of an art is often made with a note of apology. Nothing could be less justified by a realistic sense of cultural values. The method of the practical art was the first instrument forged by man for the subjugation of chaos. At the dawn of civilisation the preservation of knowledge was far more important than its discovery. The accidental fruits of experience and the creations of genius could be saved from an infallible oblivion only by being preserved in the precepts and tradition of a practical art. The superlative need for preservation made the arts inherently conservative, for there was, and is, no unequivocal difference between the change that was progress and the change that was decay. New knowledge was therefore accepted as reluctantly as old custom was given up.

An art carries its possessions in precepts and rule of thumb which are applied to individual cases in the light of a trained judgment. It does not possess principles of general validity automatically applicable; that is the method of applied science. An art is taught first in precepts and rules, secondly in experience of its material, and thirdly—and most important—by example. The method of apprenticeship is thus the keynote of education in the practical arts, because it brings the pupil into familiar contact with his material and gives him the constant example of his teacher in the actual things he himself will ultimately have to do. English medical education has long been recognised as having a characteristic product. This quality, whether we regard it as good or bad, has been due to medicine being regarded as essentially a practical art, and to the consequent predominance of apprenticeship in some form as an educational method.

If we have grasped correctly the nature of the practical arts we shall be able to specify to some extent the attitude of mind and the kind of thinking necessary for the satisfactory practice of them. It is commonly said that one of the chief objects of medical education should be to make the student think scientifically. The saying is perhaps as good an example as could be found of the need in which medicine stands for the exercise of the critical mind. To think scientifically may be supposed to mean one of two things. First, it may signify the adoption of a general habit of thought induced in, and characteristic of, those who practise experimental science. Unfortunately, however, it is not possible to show that the scientific worker outside his job displays more wisdom, insight, and practical judgment than anyone else of the same general capacity. Secondly, to think scientifically may mean to use the kind of mental process necessary for the satisfactory pursuit of experimental science. The scientific worker among other qualities must have an especially severe standard of evidence and proof; he must draw no conclusion that is not strictly justified by the evidence, and he must be content to leave in suspense any decision for which the materials are not quite complete. Now the last thing a doctor is free to do is to exercise the scientific suspense of judgment, and he scarcely ever makes a decision that is justifiable on strictly scientific grounds. The advice to think scientifically would seem, therefore, to risk paralysing his judgment rather than activating it.

The truth appears to be that what the user of a practical art needs is less the strict and limited instrument of scientific method than what may be called a soundly cultivated judgment. This requirement is more difficult to specify and much more difficult to secure. Apart from inborn capacity, it seems to depend on familiarity with the material of the art, otherwise experience, and on a broad and sound general culture which, while including a proper awareness of science, is by no means limited to it. The ancient and honourable art of medicine is being increasingly and inevitably pressed on by applied science, and suffers as well from misunderstanding and loss of prestige. It remains, however, the backbone of medical practice and indispensable

* Being the concluding section of the Lloyd Roberts lecture, entitled General Ideas in Medicine, delivered before the Royal Society of Medicine on Sept. 30th, 1935.

(*Continued from previous page*)

Capt. J. V. Dockray, from Supp. Res. of Offr., R.A.M.C., to be Capt.

MILITIA

Maj. H. C. G. Pedler retires on attaining the age limit and retains the rank of Maj.

TERRITORIAL ARMY

Lt. G. G. Farrington to be Capt.

TERRITORIAL ARMY RESERVE OF OFFICERS

Maj. H. A. Playfair-Robertson relinquishes his commn. and retains his rank, with permission to wear the prescribed uniform.

Capt. H. R. R. Mavor, from Active List, to be Capt.

ROYAL AIR FORCE

The undermentioned are granted short service commissions as Flying Officers on probation for three years on the active list with effect from Sept. 2nd, 1935: H. E. Bellringer, C. M. Carlyle-Gall, T. J. M. Gregg, R. S. B. McClean, R. S. Peill, R. L. Soper, W. J. L. Dean, L. N. Trethowan, J. B. Wallace, A. S. Amsden, A. B. Marshall, J. P. Carlile, and S. R. C. Nelson.

Flight Lt. J. Magner is promoted to the rank of Squadron Leader.

Dental Branch.—Wing Comdr. L. Somerville-Woodiwis, to D.M.S. Dept. of A.M.P. Air Ministry, for Staff duties as Chief Dental Officer, vice Group Capt. C. L. Colbran, O.B.E.

D. P. Boyle is granted a non-permanent commission as a Flying Offr.

INDIAN MEDICAL SERVICE

Capt. L. D. Sarronwala and Capt. M. N. Pai relinquish their temp. commns.

to mankind. There is therefore an especial need to-day that its characteristic mode of activity should be understood, and should not be confused with those of the other elements that make up the complex of medicine.

MEDICINE AS APPLIED SCIENCE

The conversion of the practical arts into applied sciences is a characteristic and familiar process in modern civilisation. The rate at which this change is going on is often the subject of enthusiastic and even excited comment. To the sober realist, however, it is clear that the rule of science in medicine is still not much more than strictly local and much qualified. The cases are very few in which general principles can be applied to the individual instance with the direct precision of an engineer designing a dynamo. The diagnosis and treatment of errors of refraction, certain cases of bacteriological and of chemical diagnosis, and others of physical diagnosis and treatment, with the dietetic deficiencies, make up the examples of nearly pure applied science. Elsewhere methods of precision must be very strictly subject to the art of medicine if they are not to become a mere snare. The affectation of scientific exactitude in circumstances where it has no meaning is perhaps the fallacy of method to which medicine is now most exposed. When we observe how fully the quack has assimilated the language of science it is easy to see the need for exact definitions lest we ourselves fall, with the worthiest intentions, into something not much better.

MEDICINE AS AN EXPERIMENTAL SCIENCE

When we turn to contemplate the element of experimental science in medicine, we find that the need for some effort of definition is not less than it is elsewhere. Experimental medicine, or, as it has been more conveniently named, clinical science, is at a stage when the clear recognition of it as an independent form of scientific activity—if such it really is—is peculiarly important. If it is a science capable of being pursued and developed as such, it is a competitor for support on equal terms with the other sciences, and occupies a field particularly likely to attract endowment.

Now it is often supposed that the case for the independence of clinical science is met by pointing out that the scientific element in medicine is merely applied physiology and applied pathology. From this not very recondite truth it is concluded that any further benefit to medicine from physiological and pathological discovery can come only from work done by professed physiologists and pathologists. This view seems to ignore the way in which the sciences are distributed and have come into being. Independent sciences have arisen in the past, not apparently according to whether people said they must or they must not, but through finding a natural field and doing good work in it. According to their fields of work the sciences can be divided in a broad and simplified way into two groups. There are what we may call the *general* sciences, such as physics and chemistry, by which phenomena of a certain *kind* are chosen for study. Then there are the sciences we may call *topical*, by which phenomena of a certain *distribution* are chosen for study. Belonging to the second group are such sciences as astronomy, meteorology, and geology. The fact that they could all be described as applied physics and chemistry does not in the least impair their continued independence. These sciences have readily assimilated new discoveries in physics and chemistry that were relevant to their work. They have, however, not been content merely to wait on progress in these sciences, but have been ready to undertake physical and chemical researches on their own account in problems presented by their material, and often with the happiest results. It is certain that meteorology and geology would not be in their present healthy state if they had not been prepared boldly to invade the realm of the physicist or chemist when occasion arose.

The analogy between the position of these disciplines and that of clinical science is close and instructive. Clinical science takes as its field the study of sick people, thus choosing a range of phenomena forming a natural group of the highest importance and interest, and no more arbitrary from the theoretical point of view than are those chosen by the meteorologist and geologist. The chief sciences that are general in the sense we have defined in regard to clinical science are physiology and pathology. While taking full advantages of any appropriate discovery in these sciences, it need no more wait on the advance of them than geology has waited on the advance of physics and chemistry, but is bound to undertake physiological and pathological researches of its own when they become relevant to its purpose. The art of medicine will long remain the chief implement of the practical doctor. Admirably adapted as it is for the conservation of knowledge it is in its very nature ill-suited for the discovery of new truth. I venture, in conclusion, to recall a classical example of this fact and its consequences.

A CLASSICAL EXAMPLE

In 1745 James Lind described the cure of scurvy by lemon juice; and in 1840 Steinhäuser, that of rickets by cod-liver oil. If these doctrines had been enunciated by teachers of great prestige they might have become accepted clinical precepts, and slowly acquired empirical stability. They did not have that good fortune. In spite of the desperate urgency of the problem of scurvy in the eighteenth century, and that of rickets in the nineteenth, no proof or disproof was established, because it is not in the nature of a practical art to seek for certainty in the scientific sense. The truth remained undistinguished among the innumerable opinions current about these diseases for 150 years in one case and 80 years in the other. As late as the admirable *Encyclopædia Britannica* of 1911, the most authoritative opinion inclined to ascribe rickets to an intestinal toxin and scurvy to an unknown microbe. The practical art of medicine alone knew the urgency of the problems, and actually for many years possessed the key to both. It was therefore in an extraordinarily favourable position for a direct attack on them. The method alone, it, as an art, did not and could not possess. That belonged to physiology, which for long years had no interest in the problems, and approached them at last as it were indirectly and almost with reluctance. When the cause of scurvy was at last scientifically ascertained in the classical experiments of Holst and Fröhlich two circumstances of the discovery attract our notice. It was made 173 years after Bachstrom had categorically and correctly announced the cause of scurvy and 162 years after Lind had described its cure, and it was made in the course of a research primarily undertaken for another purpose. It is difficult not to believe that an active clinical science, by its situation so favourably placed for a direct attack, could have saved some of these long and costly years.

BRITISH MEDICAL ASSOCIATION

MEETING IN MELBOURNE

THE 103rd annual meeting of the British Medical Association began in Melbourne on Sept. 9th with a civic reception at the Town Hall where the visitors were welcomed by the Lord Mayor, by Senator Sir George Pearce on behalf of the Commonwealth Government, and by Dr. Harris, Minister for Health, on behalf of the Government of Victoria. In the course of his reply, the president of the Association, Dr. S. Watson Smith, likened the rise of the city of Melbourne, which was 100 years old, to that of the B.M.A. which was only a little older. On the same evening there was a brilliant gathering at a reception given by the Government of Victoria at the National Gallery, the spacious rooms and beautiful corridors of which formed a good setting for the vivid pageant of academic robes. The Premier, Mr. Dunstan, and Mrs. Dunstan received the 2500 guests; standing with the Premier were the president-elect of the Association, Sir James Barrett, and Lady Barrett.

On Sept. 10th the adjourned annual general meeting opened in the Town Hall, in the presence of the Governor-General and Lady Isaacs, and the Governor and Lady Huntingfield, with an attendance of nearly 2000. After the induction of the new president, Sir James Barrett, his first action was to send a message of loyal greeting to the King. Sir Isaac Isaacs, in declaring the meeting formally open, spoke of the beneficent effects of medical research, and said that there was every reason to be optimistic with regard to the major problems still unsolved. The Lord Mayor of Melbourne then presented the flag of the city to the Association, and Sir James Barrett later delivered the presidential address on hospital problems which was summarised in a leading article in our issue of Sept. 21st. Before the meeting closed, a telegram was received from the King conveying thanks for the president's message.

On the afternoon of the 10th services were held at St. Paul's Cathedral, where the sermon was delivered by the Bishop of Wangaratta, and at St. Patrick's Cathedral. The president's reception took place in the Town Hall that evening, when over 3000 guests were present.

ACADEMIC HONOURS

On Sept. 11th, at a special ceremony in Wilson Hall, Sir James Barrett as Chancellor of Melbourne University welcomed the visitors, and conferred honorary degrees as follows:—

Doctor of Medicine.—Lord Horder, Sir Henry Gauvain, Dr. J. S. Fairbairn, Dr. Robert Hutchison, Prof. Edwin Bramwell, Sir William Willcox, Sir Lindo Ferguson (Dunedin), Sir Ewen Maclean, and Dr. E. Kaye le Fleming.

Doctor of Dental Science.—Dr. E. W. Fish.

In acknowledging the honour on behalf of his fellow graduates Dr. Hutchison said that medicine should keep in the closest touch with the universities so that the academic spirit might permeate its teaching and practice. Reform of the medical curriculum was desirable, and he considered that what was needed most was some change in the student's pre-medical education. At present skilled technicians rather than educated men were being "turned out," with the result that medical literature, though it abounded in facts and details, was comparatively poor in ideas and generalisations, while in point of expression and style it compared unfavourably with the medical writings of last century. Dr. Hutchison then described the development and present state of his own specialty, pædiatrics, and made a plea for a more generous academic recognition of this subject. In England and Australia such recognition was sadly lacking: there were only two chairs in the subject in England and two in Scotland. Unlike many other specialties, pædiatrics was not a narrow restricted subject, but was as broad as medicine itself, and worthy to rank with the great triad of medicine, surgery, obstetrics and gynæcology. One way in which its importance could be immediately recognised by universities was to give it more prominence in the final examination.

Another impressive ceremony followed, in the admittance of 16 Australasian doctors to membership of the British College of Obstetricians and Gynæcologists. For this purpose Sir James Barrett vacated the chair in favour of Dr. Fairbairn, president of the College.

LECTURES

Next day, at a meeting of the Royal Australasian College of Surgeons, Mr. R. B. Wade, the president, bestowed honorary fellowships on Prof. E. W. Hey Groves and Mr. H. S. Souttar; and Prof. Hey Groves delivered the first Hamilton Russell memorial oration, entitled the Romance of Surgery. He began by describing the life and work of Hamilton Russell, who died in Melbourne in 1933, and spoke of the innate modesty which forbade him to take pride in anything but the fact that he was a pupil and last house surgeon of Lister. In the course of his lecture Prof. Hey Groves also had something to say on hospital policy, and maintained that the time had come when every hospital which undertook the treatment of the sick and the investigation of disease must come under public control—for example, that of the Ministry of Health. It should be no longer possible for a private person to give or bequeath a hospital to the community without inquiry by the Ministry of Health as to how that hospital was to be supported, whether it was needed, and above all how it was to be staffed. Now that the hospital represented a scientific clinical laboratory in which the work must be highly differentiated and specialised, it was obvious that multiple small hospitals with no connexion with one another and no responsibility except to their own directors were an absurdity.

Other lectures were given during the week by Sir William Willcox (dental sepsis and its relation to focal infection), Sir Ewen Maclean (the general practitioner and forceps), Dr. S. Watson Smith (skin manifestations in diagnosis), Prof. Edwin Bramwell (specialism: neurology and medicine), Mr. H. S. Souttar (œsophageal obstruction), Dr. Robert Hutchison (dyspepsias of childhood), and Prof. Hey Groves (the "valley of dry bones").

Lord Horder gave a "popular lecture" on eugenics, Dr. H. Guy Dain an address on National Health Insurance, and Dr. Z. Mennell the Embley memorial lecture.

EXHIBITIONS AND EXHIBITS

A doctors' hobbies exhibition, organised by Dr. H. C. Colville and housed in the geology school at the University, attracted much attention. It included examples of the beautiful work of Dr. Julian Smith and many other amateur photographers, especially noteworthy being the contributions of Dr. Harold Moore and Dr. C. H. Kellaway's photographs of

Australian birds at the nest. Dr. Colville's portraits, Dr. C. T. Stephen's water-colour studies, and Dr. Douglas Thomas's landscapes were of particular interest, while Dr. Stephens also had carvings in stone and wood. Dr. G. Kaye showed a home-made lathe and a large collection of beautifully finished chrome-plated surgical instruments which he has made, including even bronchoscopes, œsophagoscopes, and illuminating laryngoscopes. Dr. D. G. Renton exhibited home-made anæsthetic apparatus, and Dr. Ivan Connor furniture of excellent workmanship. Collections of stamps, coins, old books and documents, pewter, spoons, pottery and porcelain, antique silver, native weapons, and various kinds of needlework, completed a display of very diverse talent.

A museum, prepared for the occasion by a committee of which Prof. F. Wood Jones, F.R.S., was chairman and Dr. E. S. J. King hon. secretary, was housed in the University anatomy school. No complete account can here be given of the magnificent collection brought together, but a few of the exhibits may be singled out for mention.

Dr. F. M. Burnet demonstrated lesions produced by viruses growing on the chorio-allantoic membrane of the developing hen's egg—a cultural method likely to be valuable because it provides means of measuring quantitatively the concentration of certain viruses. Exhibits of Australian snakes and the properties of their venoms were given by the Hall Research Institute and the Commonwealth Serum Laboratories. Specimens and photographs of *Tænia saginata* and of its production of "beef measles" in the ox, exhibited by Dr. Penfold and Miss Phillips of the Baker Research Institute, depicted with unusual completeness and clarity the life history of this parasite. Dr. R. A. Willis provided photographs and maps illustrating the structure of teratomata. The University department of bacteriology displayed a variety of exhibits, and a fine collection of specimens of eye diseases from the Alfred Hospital and the Eye and Ear Hospital was exhibited by Dr. J. R. Anderson and Dr. R. B. Maynard. Dr. R. Webster of the Children's Hospital showed a large series of specimens illustrating almost the whole of the pathology of childhood. The cranial characters and outstanding racial features of Australian and Tasmanian aborigines were illustrated by specimens exhibited by Prof. F. Wood Jones. From the Hall Research Institute and the University pathology department came exhibits illustrating pulmonary pathology (Dr. E. L. Cooper) and hydatid disease (Dr. R. J. Wright Smith). From the Baker Research Institute, Alfred Hospital, and University pathology department came a collection of intracranial tumours, displayed by Dr. L. B. Cox. Specimens illustrating diseases of bone was arranged by Dr. R. D. Wright, of the University pathology department; from which also came specimens of diseases of the thyroid gland, of the pancreas, and of the heart and arteries (arranged by Dr. M. C. Davis). Dr. E. S. J. King showed exhibits of the Golgi apparatus in various normal and diseased tissues. Several collections of skiagrams covered a large part of the field of radiography. Prof. R. Marshall Allan had collected from the various hospitals an almost complete series of gynæcological and obstetrical abnormalities.

Each member of the meeting received a copy of the Book of Melbourne, compiled by a committee consisting of Drs. A. P. Derham, E. Ford, T. Blois Lawton, and W. G. D. Upjohn, and edited by Dr. Mervyn Archdall, which is full of interesting information well presented. The subjects dealt with include the growth and development of the State and city, the history of the medical school, the organisation of medical research and practice in Australia, the Victorian hospital system, public health in Victoria, education in Victoria, the Australian aborigines, Australian animal and plant life, art in Australia, and sport.

SECTIONS OF MEDICINE AND SURGERY

AT a combined meeting of these sections, presided over by Sir HENRY NEWLAND (Adelaide), Lord Horder and Sir Thomas Dunhill (London) opened a discussion on

Thyrotoxicosis

Lord HORDER said that thyrotoxicosis was an unsatisfactory name, because there was no proof that the syndrome was primarily due to either hyper- or dysfunction of the thyroid gland. Although the disease had toxæmic features, the precise source and nature of the toxæmia were obscure and the pathogenesis of the disease unknown. The thyroid might be more sinned against than sinning. Efforts at analysis of the syndrome had perhaps confused rather than clarified our ideas. As to ætiology, there was a diathesis of Graves's disease, sex and sex epochs were of obvious importance, and so was psychic trauma. Some workers laid stress on focal sepsis, but the speaker found the search for this disappointing in most cases. In the established disease endocrine imbalance became obvious, and the symptoms unmistakable. It was in the early less obvious cases that diagnosis was most important. Training in observation of facies and behaviour was the key to the detection of early cases. If, instead of hurriedly falling on the patient with all our diagnostic equipment, we were merely to "stand and stare," it would be more often evident to us that the patient was staring. Minor symptoms—rapidity of manner, the moist hand, flushing, emotional and temperamental changes, and so on—were to be watched for. In treatment, judicious but uncompromising ordering of the patient's routine of life was essential; and bromides or belladonna were helpful in some cases. The so-called specific sera were valueless. Partial thyroidectomy had so completely justified itself that discussion of this subject was superfluous. There were three main indications for surgical treatment: (1) persistence of symptoms after six months' proper control of the patient's routine life, (2) definite relapse after stabilisation on a satisfactory routine, and (3) the appearance of auricular fibrillation or cardiac dilatation. Thyroidectomy achieved its best results in well established cases. When we knew more of the nature of the benefits of thyroidectomy, the pathogenesis of the disease would be better understood.

Sir THOMAS DUNHILL said that in spite of improvements of surgical treatment, the Registrar-General's figures showed a great increase in the numbers of deaths from Graves's disease in Great Britain in recent years. Exaggerated statements were often made about this disease, such as that rest and iodine would always make operation safe, or that surgery guaranteed a cure. These were mis-statements, and the word "cure" had much better be dropped. As to symptomatology, the patient's inherited constitution was probably of main importance in determining to what organ or function the principal symptoms would be referable. With regard to cardiac failure, fewer water-logged cases were seen than formerly and more with auricular fibrillation. Most of the fibrillating cases regained normal rhythm after operation, but careful control of régime thereafter was essential if relapses months or years later were to be avoided. Glycosuria was often the main symptom, and operation was often efficacious in removing this. The most pathetic group of cases comprised those with change of temperament; and, before operating on these, careful consideration must be given to past and family history, and consultation

with an experienced physician was essential. A decided risk was the development of a demented state following operation. The worst patients to handle were those who were badly emaciated; it was often essential to operate on these in stages, and ligation of the thyroid arteries was helpful in improving nutrition. In assessing operative mortality, it must be remembered that patients with Graves's disease not infrequently died suddenly quite apart from operation. Sir Thomas Dunhill then described—as an unusual symptom—the development of bilateral patches of mucinous degeneration beneath the skin of the legs, associated with coarseness of the skin itself. These patches, which had been badly named "localised myxœdema," disappeared along with the exophthalmos after successful operation; and it was pertinent to ask whether a similar lesion of the orbital tissues was responsible for the exophthalmos. With regard to the operation in severe cases, the smallest possible inroad was desirable. The statement often made that excision removed the source of the poison and that once over the operation the patient would thereafter steadily improve was false. There was little doubt that storage of the secretion in tissues other than the thyroid could persist for days or weeks.

DISCUSSION

Prof. C. E. HERCUS (New Zealand) said that in New Zealand both simple goitre and exophthalmic goitre were very common, and the two conditions were clearly related. The incidence of thyrotoxicosis was highest in endemic goitrous districts. From the data collected by the thyroid clinic in Dunedin, it appeared probable that there was no real basis for the distinction between primary Graves's disease, secondary Graves's disease, and simple goitre. The cases of simple goitre often exhibited mild symptoms of thyrotoxicosis. New Zealand provided many examples of familial thyrotoxicosis.

Dr. A. W. HOLMES A COURT (Sydney) briefly outlined some aspects of diagnosis and medical treatment. He considered that irradiation with X rays was useful in relatively few cases, those with early diffuse enlargement. Iodine amelioration was well recognised but by no means invariable. He mentioned a case in which cardiac failure had ensued despite very drastic attack on "septic foci."

Sir CARRICK ROBERTSON (New Zealand) endorsed the remarks of Prof. Hercus regarding the incidence and relationships of various types of goitre in New Zealand. He deprecated the indiscriminate and long continued use of iodine. He performed his operations in one stage wherever possible, removing about four-fifths of each lobe. Among 754 cases he had had occasion to do the two-stage operation in only two. Ligation of the arteries was a valuable aid. He used local percaine anæsthesia with proper premedication, and adjuvant gas and oxygen. If cyanosis appeared during operation, he did not hesitate to open the trachea which he sutured again when the operation was completed. He had had seven deaths, a mortality of about 1 per cent. Four of these were in cases of "apathetic" thyrotoxicosis with cold, dry skin, cases which he therefore regarded as bad surgical risks.

Dr. H. HUME TURNBULL (Melbourne) said that while it was true that even severe cases did sometimes recover without special treatment, surgery was the only really valuable method of treatment. Although he himself was a physician, he thought that the physician played a relatively slight part in the treatment of thyrotoxicosis. Sir Thomas Dunhill had remarked on the increasing number of deaths from Graves's disease recorded by the Registrar-General; but this might easily be complementary to his other observation that water-logged cardiac cases were diminishing; cases which formerly were classified as dying from "heart failure" now being correctly diagnosed as due to thyrotoxicosis. As to focal sepsis, while there was no doubt that this aggravated the disease, he had never seen a case in which thyroidectomy had been avoided by removal of septic foci. The trend of the present discussion had been to emphasise the danger of operation; but he thought that greater danger lay in non-operative treatment, and surgeons should not be too modest.

Dr. ALAN NEWTON (Melbourne) agreed with Dr. Turnbull that the increasing recognition of the thyroid origin of heart failure explained the increasing number of deaths recorded from thyrotoxic disease. Dr. Newton referred to the serious complications of exophthalmos; and to an unusual manifestation of Graves's disease, paresis of the muscles of the upper parts of the face. The surgeon should remember that these patients were frightened people, and therefore pre-operative treatment should be by the surgeon himself and the patient's nurses should not be changed. It was difficult to obtain these conditions in public hospitals, and this might account for the higher mortality-rate in these institutions. In his own private practice the mortality-rate was 0·4 per cent., but at the Melbourne Hospital his cases had a mortality of 3 per cent. Analysis showed that nothing short of subtotal thyroidectomy gave satisfactory results.

Dr. S. PERN (Melbourne) upheld the view that focal sepsis was an important causative factor.—Dr. S. V. SEWELL (Melbourne) endorsed the remarks of Dr. Turnbull on the preponderating value of surgical treatment.—Dr. C. DENNIS (Melbourne) said that over-treatment with X rays had brought this mode of therapy into disfavour, and asked the openers whether they had seen benefit from repeated moderate doses.

Dr. H. POATE (Sydney) said there were three main clinical types of the disease, the cardiac, the nervous, and the metabolic. X ray treatment was of value in young patients with cardiac symptoms, but not in any other cases. He endorsed Sir Carrick Robertson's remarks on the risks of "iodine addiction." He believed that the thyrotoxic patient was on the verge of acidosis, and that pre- and post-operative alkalinisation was of decided value.—Prof. A. M. DRENNAN (Edinburgh) recalled the importance of iodine deficiency in the causation of goitre, and commented on the low iodine content of the hyperplastic thyroid tissue in thyrotoxicosis.—Dr. F. HANSMAN (Sydney) said that in thyrotoxicosis there was loss of calcium and phosphorus from the body and this suggested the operation of some endocrine factor other than thyroxine.

Lord HORDER, in reply, said he wished the problem was as simple as some of the speakers' remarks implied. He again stressed the fallacy of assuming that Graves's disease was initially one of thyroid disfunction. Because thyroidectomy at a certain stage of the disease achieved such beneficial results, it was fallacious to argue that the thyroid was the primary source of trouble. The position was analogous to that of splenic anæmia or of acholuric jaundice, in which the beneficial effect of splenectomy at a certain stage did not necessarily mean that these conditions were primary diseases of the spleen. Lord Horder regretted that Prof. Hercus had omitted to

describe the nature of the mild supposedly toxic symptoms in patients with simple goitre in New Zealand: it was important not to mistake the symptoms of simple nervousness for toxic symptoms. He disagreed with Dr. Turnbull's view that the physician was almost useless in treating Graves's disease; the physician should play an important part in close collaboration with the surgeon. A final warning with regard to operation was—if you wish to do a disservice to thyroidectomy, do it too early.

Sir THOMAS DUNHILL, in reply, urged Prof. Hercus to publish details of his observations on the relationship which he had described as existing between simple and toxic goitre in New Zealand. Regarding Sir Carrick Robertson's technique, Sir Thomas said it was also his own practice to complete the operation in one stage whenever possible; but there were cases which could only be dealt with safely in two stages. In reply to Dr. Dennis, he maintained that X ray treatment was of value in early cases in young people; but there were many cases which, after alleged cure by X radiation, returned with auricular fibrillation. In treating Graves's disease there was need of the closest coöperation between physician and surgeon; and we must retain sanity, moderation, and judgment.

SECTION OF OBSTETRICS AND GYNÆCOLOGY

AT the first meeting of this section, held under the presidency of Dr. J. S. FAIRBAIRN (London), a discussion on the present position of

Cæsarean Section in Obstetric Practice

was opened by Mr. J. BRIGHT BANISTER (London). At first, he said, this operation was adopted as a life-saving method for both mother and child, but there was now a tendency to adopt it as the easiest method of delivery. Such interference on insufficient indication was more readily undertaken by those who did not appreciate the risks involved. There was no doubt that the use of Cæsarean section was excessive, with an associated increase in the maternal death-rate, and a reduction was strongly to be recommended. The operation occupied an unjustifiable position in obstetric practice, its incidence being too high, its indications too wide, and its mortality too great for any method attempting to lessen maternal mortality. Analysis of a series of cases reported in the *American Journal of Obstetrics* for September, 1928, showed that these strictures were not undeserved; for in this series 55 separate indications for Cæsarean section were noted, including such conditions as failure to progress, advanced age of mother, breech presentation, previous perineal repair, and unwillingness to undergo pains of labour. The maternal mortality-rate in the series was 6·6 per cent.; could it therefore be defended on the grounds of safety? In England and Wales the maternal mortality for Cæsarean section cases was 16 times as great as that for obstetric cases generally. In British maternity hospitals the mortality-rate of Cæsarean section undertaken by competent operators was 5·8 per cent. Mr. Banister considered that a purely surgical outlook on purely obstetric problems was a patent cause of the great increase in the operation. A contempt for Nature came with the knowledge that the uterus can be easily emptied. "Trial labour" was often a travesty in contracted pelves. Before Cæsarean section was undertaken a trial labour patient should have had second-stage pains for several hours. There was also failure to appreciate the conditions present in a given case; "failure to progress" meant that the obstetrician was ignorant of the conditions present. It was essential that obstetrics should be in the hands of obstetricians and not of surgeons who did obstetrics. He considered that unnecessary value was given to the life of the child to the sacrifice of the life of the mother. He had been surprised by the importance laid on laboratory findings as compared with clinical investigations in American obstetric practice. For example, the Cæsarean rate in one hospital was 4·2 per cent.—for such indications as "slight blood pressure," or "slight rise in blood-urea." It was not sufficiently realised that Cæsarean section was an abdominal section which had at least a 1 per cent. operative mortality compared with a 0·2 per cent. obstetric maternal mortality in all cases. Cæsarean section at present was a prostitution of a useful operation which was performed far too freely when accurate obstetric methods would avail.

Prof. J. B. DAWSON (Dunedin, New Zealand) spoke of the difference between British and American obstetric figures. Normal labour was a perfect mechanical procedure, whereas difficult labour was very imperfect. He suggested that the comparison of statistical figures is unfair, in that the mortality of a serious group of cases is compared with the mortality of all cases, 90 per cent. of which are normal. What we wanted to know is what would have happened if the obstetric dilemma had been circumvented by methods other than Cæsarean section. He believed that the procedures of high forceps or craniotomy would have the same mortality. He considered that mortality received too much consideration as compared with morbidity; many women had vaginal deliveries at great maternal cost and a staggering number of fœtal deaths. To finish vaginal delivery might be a personal triumph for the obstetrician, but was often disastrous for the mother. Thirty years ago Cæsarean section was said to be performed too often; the mortality was still too high and Prof. Dawson believed that this was due to too many operations performed too late. The operation was not used too much but was too much delayed. Improvement would come by reducing delay rather than reducing use; great care should be taken to select the optimum time of performance and suitable surroundings. The training of an expert surgical team was an important factor in the success of this operation.

Dr. W. IVON HAYES (Melbourne) agreed that bad selection of cases, delay, and faulty technique were responsible for the present high maternal mortality. The high death-rate associated with cases of renal toxæmia called for the greatest conservatism and the temptation to operation must be resisted. Severe accidental hæmorrhage had not been treated by Cæsarean section for the past six years in the Women's Hospital, conservative measures having proved satisfactory. In the management of disproportion one was faced with elective Cæsarean section or trial of labour. The fatalities occurred in the late cases, and the mortality rose very rapidly after membranes had been ruptured for more than 12 hours. Lower uterine section should be used in all potentially septic cases, while Cæsarean hysterectomy should be undertaken for definite septic conditions. He agreed that Cæsarean section was an easy escape from difficulties but a dangerous method of delivery, and the results could be improved by earlier recognition of indications.

Dr. H. A. RIDLER (Sydney) said that generally the

less competent the obstetrician the more Cæsarean sections he performed. The great widening of indication in the last 20 years might be evidence of the craze for speed. The high mortality-rate was lessened by adopting the lower-segment operation after "failed forceps" or prolonged labour with ruptured membranes. Late recourse to operation, unfortunate choice of case, and unsuitable surroundings all gravely increased the maternal mortality-rate. He concluded with the plea for more intensive obstetric training.

Dr. M. ELLIOTT SMITH (Brisbane) presented a series of figures from the Queensland Obstetrical Society. Antenatal care was still, he said, the most important factor and good surroundings for delivery were necessary if difficulty was anticipated. Cæsarean section had no place as an operation of last resort; but it was sometimes hard to decide when it should be performed.

Dr. F. BROWN CRAIG (Sydney) pointed out that Cæsarean section was done more often in the suburbs than in the teaching hospitals. He considered that mature obstetric opinion should always be obtained before the operation is undertaken.

Dr. E. R. WHITE (Melbourne) held that often the operation offers the best chance of a living child to the elderly primipara. The after-care of Cæsarean section was important; one of the most serious complications being abdominal ileus, the incidence of which was much reduced by adequate pre-operative care.

Dr. J. S. GREEN (Melbourne) said that the greatest problem was the nearly normal case which had a tedious labour. There was great risk of stillbirth in these cases and the problem of Cæsarean section was often canvassed. He also mentioned the great difference in the incidence of the operation at various institutions. He inquired if Mr. Banister could furnish any reason for this difference in incidence. He asked also what was Mr. Banister's attitude when confronted with the choice between undertaking a difficult forceps extraction with considerable risk to the child, or performing Cæsarean section. Often there was considerable psychological difficulty with regard to the survival of the child in trial labour.

Dr. GEORGE SIMPSON (Melbourne) considered that Cæsarean section and sterilisation was the procedure of choice for cases presenting medical contra-indications to further pregnancy.

The PRESIDENT considered that the emphasis laid upon possible resort to Cæsarean section lessened the effect of good obstetric teaching. "Request" operations were ethically very undesirable.

Mr. BANISTER in reply said that the meeting evidently agreed that Cæsarean section was undertaken too often and that each case must be considered separately. The "quick" decision in obstetric cases was bad, leisurely methods being desirable. The quasi-normal case should be given a reasonable trial of labour. He could not agree that an elderly primigravida was a "ripe" subject for Cæsarean section. In reply to Dr. Green, he said that the East End Maternity Hospital is staffed by general practitioners, but that the vast majority of the work is done by the matron—an outstanding midwife. This hospital served the same district as the London Hospital where a large number of the abnormal cases were admitted. There was, therefore, not quite the same influx of all types of cases at the East End Hospital. In making a decision in a difficult case, one should make a careful examination under general anæsthesia and then decide between Cæsarean section and the application of high forceps.

Placenta Prævia

Sir COMYNS BERKELEY (London) in opening a discussion on this subject based his remarks on an exhaustive investigation of 4374 cases collected from 19 British hospitals. He advanced a plea for the universal adoption of the report-form approved by the obstetrical section of the Royal Society of Medicine. As a result of his investigation, Sir Comyns was enabled to formulate a series of rules to be observed in the treatment of placenta prævia. These were, briefly: (1) to control the bleeding as soon as possible; (2) to combat shock, if present; (3) to use every endeavour to prevent sepsis; (4) not to hasten delivery, apart from cases of Cæsarean section; (5) to make no pelvic examination unless prepared to commence treatment at once; (6) not to expel the placenta until entirely separated, unless there was hæmorrhage; (7) to use a pointed instrument to pierce the placenta, should this be necessary; (8) to use an efficient antiseptic solution, if packing of the vagina is undertaken; and (9) to avoid Cæsarean hysterectomy if possible. Control of the hæmorrhage should be the main aim in treatment as the patient is never safe until the uterus is empty and well retracted. Packing the vagina was deprecated in view of the increased rate of sepsis associated with it.

Shock was a frequent cause of death and should be treated early and energetically by intravenous glucose therapy or blood transfusion. The commonest cause of death, apart from those who died undelivered, was sepsis, and the greatest care in the management of these cases was essential. If shock had been treated and hæmorrhage controlled, there should be no haste in delivery, avoiding such procedures as version and immediate extraction, or the abuse of pituitrin. Pelvic examination might increase the seriousness of hæmorrhage and should only be undertaken if one was prepared to control any further blood loss at once. No attempt should be made to expel the placenta until it is completely separated unless post-partum hæmorrhage occurs, even though it is small in amount, when the uterus must be emptied. If the placenta was central in position and had to be perforated, a pointed instrument such as a uterine dressing forceps should be employed because it carried less risk of further placental separation. The maternal mortality of Cæsarean hysterectomy was very high and the operation should be avoided where possible though it might be essential if hæmorrhage did not cease after delivery.

Sir Comyns drew attention to the diversity of methods in use in treating the various types of placenta prævia. He suggested that the best results would be obtained when one specific method of treatment was followed to the exclusion, whenever possible, of any other. Although it was desirable that the treatment be carried out by experts, in many cases immediate steps must be taken to control hæmorrhage.

When dealing with central placenta prævia the safest method for both mother and child was Cæsarean section when the patient was 36 weeks pregnant or over. With the exception of bringing down a leg in a breech presentation, the mortality of Cæsarean section was by far the lowest of any method. In cases less than 36 weeks pregnant, the advantage of Cæsarean section was not so great, but it offered

far better chances of securing a child which would survive. Even if the child was dead, Cæsarean section was still the treatment of election in patients 36 weeks pregnant and over. Under 36 weeks of pregnancy the patient should be delivered by bringing down a leg. Lastly, one was justified in performing Cæsarean section in a multipara over 36 weeks pregnant because the chances of a living child being obtained were good; but the operation was not justifiable under 36 weeks pregnancy, because the patient already had children, the viability of the child was much reduced, and the method of bringing down a leg in a breech presentation had a lower maternal mortality.

Incomplete placenta prævia was best treated by rupturing the membranes and allowing labour to proceed, a tight binder being applied. The death-rate associated with this method was far lower than by any other method. Bringing down a leg in a breech presentation was also satisfactory. In cases of this type Cæsarean section and spontaneous labour had considerably higher maternal mortality. Lateral placenta prævia was as a rule over-treated. The safest course was to allow labour to progress without interference. The next safest methods were rupture of the membranes and bringing down a leg in breech presentation. Vaginal packing was to be condemned because of the grave risk of sepsis, and in many cases it was not satisfactorily performed.

Prof. J. C. WINDEYER (Sydney) expressed the hope that the obstetric hospitals of the Empire would adopt the form of report recommended by the obstetric section of the Royal Society of Medicine. The advantages of various forms of treatment could then be estimated with considerable accuracy. He had been an advocate of scalp traction for some years. This method possessed the advantage that a minimum of vaginal manipulation is required, that the forceps could be applied quickly through a very slightly dilated os uteri, and traction maintained by application of a light weight. It could be used in most of these cases and should take the place of vaginal plugging or bipolar version. In the management of the third stage of labour control of hæmorrhage was of the greatest importance. Careful observation of the fundus uteri and vaginal introitus was necessary. If persistent loss occurred, an attempt to express the placenta should be made. If unsuccessful, manual removal of the placenta and bimanual uterine compression with the exhibition of pituitrin should be performed. Steady compression as a rule avoided the necessity for uterine packing. Prof. Windeyer illustrated his remarks by showing the results of the last 100 consecutive cases under his care. He did not agree with Sir Comyns Berkeley that vaginal plugging was dangerous; with care risk of sepsis was not great.

Dr. A. M. WILSON (Melbourne) quoted a series of figures from Melbourne obstetric hospitals. Placenta prævia was a comparatively rare complication, he said, and consultant opinion should be obtained in these cases. The patient should be placed in satisfactory surroundings before active surgical treatment was undertaken. Painless causeless hæmorrhage usually indicated the presence of placenta prævia and the procedure to be adopted should be decided on at once. It was rare for such patients to die as a result of their first hæmorrhage and the most serious type was one that had had repeated hæmorrhages. Once diagnosed, termination of the pregnancy must be attempted immediately. Stimulative treatment was often successful. Dr. Wilson advised Cæsarean section for the central type of placenta prævia. These cases should be blood-typed on admission because blood transfusion was so often necessary. Vaginal packing was not advisable owing to the risk of sepsis. If used it should be only a temporary expedient.

With lateral or central placenta prævia Dr. Wilson advised rupture of the membranes and/or the application of Willett's clamp. Breech presentations usually did well if a leg was pulled down and the patient allowed to deliver herself. Bipolar version without extraction was the method of choice for a serious emergency if surgical aid was not available; there was, however, a great infantile mortality. Cæsarean section was life-saving in many cases, but it was desirable that the patient should be a good surgical risk. It was an excellent operation in picked cases over 36 weeks of pregnancy. Simpler methods were however, as a rule, safer to the mother.

Dr. LANDER (England) inquired whether placenta prævia was a consequence of toxæmia or a mere anatomical mishap. In general practice one had to decide quickly in these cases. He found that bipolar version sometimes increased the hæmorrhage and was technically difficult. He considered that rupturing the membranes and allowing the free flow of liquor amnii was usually sufficient. He also emphasised the value of posture and fundal pressure.

Dr. M. ELLIOTT SMITH (Brisbane) supported Prof. Windeyer in his advocacy of plugging. There was no doubt about its value, he said, although its emergency use was sometimes dangerous because of the lack of asepsis. He had found a uterine dressing forceps a useful instrument with which to perforate a centrally situated placenta.

Dame CONSTANCE D'ARCY (Sydney) thanked Sir Comyns Berkeley for the nine points he stressed. She commended Cæsarean section as the operation of choice in central placenta prævia, whilst Braxton Hicks version was very valuable in emergency. She considered that in Australasia the American influence on obstetric practice preponderated. She drew attention to the advantages of spinal anæsthesia in dealing with some difficult cases.

The PRESIDENT agreed that in many cases minor degrees of placenta prævia were over-treated. He advocated Cæsarean section in cases over 36 weeks of pregnancy having complete placenta prævia.

Sir COMYNS BERKELEY in reply emphasised that his paper represented not his own experience, but that of a great number of obstetricians. It was most essential that having diagnosed placenta prævia one should decide upon a method of treatment and carry it out. In general he would advise Cæsarean section for the complete cases, rupture of the membranes for the incomplete cases, and watchful observation for cases of lateral placenta prævia. He advised all members of the section to read his statistical table carefully, when he had no doubt that the best method of approaching these cases could be decided. He agreed with Dr. Wilson that the pregnancy should be terminated as soon as hæmorrhage occurred, but was totally opposed to vaginal plugging.

Summer Time, which commenced in Great Britain, Ireland, the Channel Islands, and the Isle of Man on Sunday, April 14th, will cease on Sunday next, Oct. 6th, at 3 A.M., when the clock will be put back to 2 A.M. The hour 2–3 A.M. Summer time will thus be followed by the hour 2–3 A.M. Greenwich time.

MARGATE AS A HEALTH RESORT

B.H.R.A. CONFERENCE, SEPT. 27TH–29TH

BY providing an Indian summer of almost tropical intensity the climate of Margate did much to dispel the idea, if such still exists, that the Thanet coast is so bracing as only to be enjoyable for two or three months at the height of summer. Visitors to the week-end conference were given a cordial welcome from the Mayor and corporation whose hospitable reception included a concert at the Winter Gardens on the Saturday evening and a luncheon at St. George's Hotel on the Sunday.

TOWN PLANNING AT THE SEASIDE

The meetings of the conference began on the Saturday morning; the first subject for discussion being "Town Planning at the Seaside," opened by Mr. CLOUGH WILLIAMS ELLIS, F.R.I.B.A. He emphasised the need for coördinate planning in seaside resorts; looking at our coast line as a whole it was evident that the best planned towns were usually found to have been built under the benevolent despotism of some great landed proprietor; unrestrained individual enterprise was certain to result in disorder and ugliness. Those towns were fortunate which possessed streets and squares dating from the Regency or later eighteenth century. Victorian and Edwardian times were the dark ages of architecture and few seaside resorts have escaped the conglomeration of sordid streets and rows of villas which this period perpetrated. Recent years have seen a return of life to architecture, new forms are being discovered, and Acts of Parliament had now vested in local authorities powers which were being used to bring order into the planning of the towns and protection of the beauty spots from the uncontrolled commercialism of the speculative bungalow builder.

Mr. WESLEY DOUGILL, A.M.T.P.I., continuing the discussion, began by referring to the greatly increased population of the coast not only for holidays but for residence. This change has been due in large extent to improvements in road, rail, and air transport; so great has been the exploitation of the coast that the seaboard is being rapidly built up and seekers after unsophisticated resorts are being driven further along the coast until soon they will be chasing a will o' the wisp at Land's End. He suggested that government supervision was necessary to control this change which threatened to end in the building up of many headlands and other beauty spots on the coastline. Caravan and shack colonies should be concentrated in inconspicuous places. Good work is already being done under the Town and Country Planning Act (1932), which has enabled certain municipalities to acquire and zone as open spaces land near their boundaries. The speaker also referred to the advisability of more provision for indoor amusements at the seaside as the British climate is uncertain even in the middle of the summer, and if a longer season is required more must be done to entertain visitors when the beach is too cold.

Mr. E. G. S. ELLIOTT, A.M.T.P.I., directed attention to the importance in a town-planning scheme of the first impression made on the visitor. The railway station should be as near the sea front as possible, as the new arrival will receive a poor impression if he starts with a long taxi drive through mean and sordid streets which give no indication of their proximity to the sea. Aerodromes are becoming increasingly important and should be placed as near the town as possible; this arrangement not only saves the traveller's time but, as the Germans have discovered, an aerodrome, particularly if surrounded by a park containing restaurants and tea gardens, proves a great attraction to visitors. It is important to note that while the Englishman's appreciation of architecture is negligible he has a passionate love of trees, flowers, parks, and gardens.

CONVALESCENCE ON THE THANET COAST

The subject for the afternoon session was opened by Sir LEONARD HILL who began by saying that, although there are weakly and infirm people who require warmth, a bracing sunny climate is the best for the majority. In the constitution of a bracing climate cooling power is one of the most important factors; this is very great on the top of a cliff on the east coast. Not only the actual temperature but the quality of the ray seems to be important; rays from a bright source such as the sun are more invigorating than those from a dull source. Owing to their relatively large body surface children lose heat quickly when exposed to cold moving air and require not only plenty of food but vigorous exercise to keep warm. Plenty of rest is also essential and when resting they must be kept warm. Swimming increases the heat production about ten times.

Mr. W. GREENWOOD SUTCLIFFE referred to the pioneer work of Lettsom in making Margate the first centre for the treatment of surgical tuberculosis. Rest and a maximum of fresh air and good food had always been the factors which Margate treatment depended on. Until recent years excessive operative treatment followed by extensive sepsis was often encountered. At Margate, extension for the correction of deformity, immobilisation, and an absolute minimum of surgical interference is the rule, and the results obtained are at least as good as those following more modern methods. As regards tuberculous cervical glands more than 90 per cent. disappear with conservative treatment, but if they have been present for more than six months their disappearance without operation is doubtful, and if caseation appears complete removal should be considered. The speaker also referred to the advantages of Margate as a place for convalescence after severe surgical operations.

Dr. H. M. RAVEN described the physical geography of Thanet; a rainfall of 27 in. combined with porous chalky soil and a high sunshine record (1700 hours) combined to give the district a healthy and bracing climate. The speaker thought the hardness of the water, due to calcareous matter, might be beneficial in promoting the calcification of tuberculous lesions. As regards the type of patient to be sent to Thanet, delicate and convalescent children did exceptionally well but caution was necessary with cardiac cases especially in winter and careful medical supervision was essential. The stimulating air of the district is particularly suitable for cases of malnutrition, and statistics from an open-air school for girls sent by the "Save the Children" Fund showed an average increase in weight of 7·68 lb. in three months. Boys, being more active, did not gain so rapidly.

Nervous children and those suffering from chorea are, said Dr. Raven, usually benefited, but certain highly excitable children are over-stimulated and must be transferred to a more relaxing climate. In convalescent homes supervised sun and air baths are of value and children improve much faster when weather conditions permit of this treatment. Sea-bathing is to be recommended with more caution, as when unregulated too long immersion is frequent and

may be deleterious. Paddling he considered to be a frequent cause of chills, especially among the children of visitors who often had their feet wet for hours at a time.

Dr. E. P. POULTON began by referring to the popular idea that, in regard to climate, bracing represents all that is good and relaxing that which is evil. In practice a relaxing climate is required in certain conditions, but owing to the unpleasant association the term sedative is preferable. The speaker considered that the British Health Resorts Association should initiate an inquiry into the climatology of the British Isles; the collection of data and its correlation at a central bureau would help to get away from such medico-popular writing as that the value of the seaside depends on the amount of oxygen (or ozone) in the atmosphere or even on the purity of the air. Sunbathing is the rational treatment for diseases depending on deficiency of sunlight, but Dr. Poulton doubts if perfectly healthy people are wise in attempting to pigment themselves—pigment being a natural protection against the harmful effect of the sun's rays. The value of the sea coast was recognised by Richard Russell (1700–71), who noticed that the fisherfolk were free from scrofulosis and that delicate children returned from the sea "bare-necked, their hair shaved, and tumours of the neck healed and the countenance healthy."

In the general discussion which followed there was some difference of opinion about the relative importance of exposure and infection in the production of the common cold. Several speakers congratulated the municipality of Margate on the progress that has been made in recent years in town planning and in the provision of sheltered places and amusements where entertainment can be found in bad weather.

IRELAND

(FROM OUR OWN CORRESPONDENT)

FEES FOR ADMINISTRATION OF ANÆSTHETICS

THERE has been much discontent throughout the country because of the reduction in the scale of fees previously sanctioned for the administration of anæsthetics in district hospitals. For many years a scale was in existence which, though by no means liberal, was accepted generally by the profession. Early last year the Department of Local Government and Public Health drafted a new scale which was issued to the local authorities with instructions that payments in excess thereof would not be sanctioned. The scale was drafted without notice to, or consultation with, the profession, and without any complaint having been made by the local authorities as to the previous scale. It made drastic reductions in the fees allowed, some of the fees being as low as 7*s.* 6*d.*! Protests, in which the local authorities were at one with the profession, were made by medical men all over the country, but the Department remained obdurate. Medical men have been slow to refuse their assistance, hoping that the Department would be willing to enter into discussion with their representatives, but so far this hope has been vain, and there are signs that their patience is wearing down. In County Clare recently, the medical officer of the Scariff district hospital reported to his board that it was impossible to obtain the services of medical men to administer anæsthetics to patients in the institution for the fees specified by the Department. The Department in reply directed that all patients requiring operations be sent to the county hospital at Ennis, or, if they should be unfit for removal, that the surgeon of the county hospital should be summoned to perform the necessary operation. The board of health refused to adopt this unworkable and costly scheme, and proceeded to appoint an anæsthetist at an annual salary. In attempting to impose a new and inferior scale and in refusing to consider the matter with representatives of the profession, the Department has acted in a harsh and unreasonable way, and if there is a general breakdown as regards the giving of anæsthetics in district hospitals, the responsibility will rest with the Department.

THE DISPENSARY MEDICAL OFFICER'S RESIDENCE

It is a regulation of the Department of Local Government and Public Health that the dispensary medical officer should reside within his district. It is clear that for one reason or another it may not always be wise to insist on the letter of their rule, and it not infrequently happens that the best point for the residence from the point of view of the convenience of the patients is outside the geographical bounds of the district. The Department has in the main used a wise discretion in the application of the rule, and there is rarely cause for complaint. A curious position, however, is likely to arise in County Roscommon. The dispensary medical officer of the Kiltoom district resides and has resided for years in the town of Athlone, just outside his district. The Department refuses to sanction this arrangement any longer, and has directed the board of health to choose a site and build a residence within the district. To this course the ratepayers object, urging that the salary and private practice of the district would not attract an experienced doctor, and that the people of the district would thereby suffer. In this view the chairman of the board of health concurred, stating that if the doctor was compelled to live in the district and pay an economic rent for his residence, in the event of a vacancy they would find no applicants to fill it. It was stated also that in the adjoining Brideswell district there had been a succession of 72 doctors in 70 years!

HEALTH OF COUNTY DUBLIN

In his annual report for 1934 Dr. J. A. Harbison, medical officer of health for County Dublin, records a steady increase in the birth-rate and a fall in infant mortality. The general death-rate had increased slightly from 13·8 per 1000 in 1933 to 13·9 in 1934. Heart disease was by far the largest individual cause of death and accounted for one-sixth of the total number of deaths. The number of deaths from cancer had fallen from 137 to 122 in the year, and there was also a fall in the number of deaths from infectious diseases, but deaths from measles numbered 47, showing a higher total than all the deaths from acute notifiable infectious diseases together. Speaking of tuberculosis, Dr. Harbison states that there was considerable difficulty in obtaining sufficient beds for patients, particularly for chronic and advanced cases. He remarks that too many of the patients failed to present themselves for examination until the disease was far advanced. There was no appreciable reduction in the mortality from tuberculosis in the past four years. As to housing, apparently the worst housing conditions exist in the suburban areas, where there are numerous collections of badly lighted,

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POST-GRADUATE LECTURES

LAST week-end several of the London teaching hospitals held short post-graduate courses, and as in previous years we propose to publish abstracts of some of the lectures delivered. Of the three which are summarised below, those of Dr. Miller and Mr. Williams were given at St. Mary's and Prof. Wright's at the Middlesex Hospital.

SLIMMING PROBLEMS IN CHILDREN AND ADOLESCENTS

(DR. REGINALD MILLER)

BY the use of the term "slimming problems" I intend to convey the fact that I do not propose to deal merely with the treatment of obesity. There is a good deal more of interest in the subject than that. Prevailing fashions have led to much that is extravagant in thought and practice in these matters, and perhaps our profession has not altogether escaped these influences. In one respect the patients whom we see on account of their supposed over-weight differ from the ordinary run of cases in that at the back of their trouble there is rarely any physical disease or disorder, and in slimming problems the psychology of the patient comes to the front. It is, perhaps, a pity that the degree of slimness at the moment demanded by fashion does mean in many instances real under-nourishment and a consequent strain on physical and nervous health. Most people may be said to have an optimum weight and this is not necessarily their minimum or maximum weight. Sometimes by remembering this we can be of help to those who consult us.

It is convenient to consider the subject in four age-groups: (1) infancy; (2) childhood to puberty; (3) puberty to adolescence; (4) adolescence.

1. *Infancy.*—Towards the end of infancy, before the child begins to walk, there is a natural fat period. Provided that rickets, anæmia, and hypothyroidism are absent, the condition is harmless though it may delay slightly the onset of walking. The condition should generally, therefore, be left alone. If for any special reason it is necessary to treat the over-weight it should be done by reducing the intake of fat and sugar rather than by cutting down the bulk of the food taken.

2. *Childhood to Puberty.*—During childhood up to the age of puberty there are many over-fat children. An attempt may be made to class them into three groups—endogenous, exogenous, and endocrine; but for individual cases it is none too successful. Unfortunately doctors are apt to focus upon the endocrine possibilities and commonly diagnose Fröhlich's syndrome on totally insufficient grounds. This syndrome is in reality a very rare condition and mere fatness is not enough for its diagnosis. Some degree of physical or genital infantilism should be present, and although the second is difficult to recognise before puberty (though often diagnosed), delay in ossification in bones can be sought for in order to substantiate physical infantilism. Fröhlich's syndrome is due to organic disease affecting the pituitary and supposed to cause deficient secretion of the posterior lobe. Most of the over-weight children at this age are large in stature and powerful in build as well as fat, and if there is a pituitary influence it is more likely to be an excess of anterior-lobe secretion rather than a deficiency in posterior-lobe secretion. Caution should be exercised before diagnosing Fröhlich's syndrome, as later the punctual appearance of puberty may show the diagnosis to have been wrong. Treatment at this age is rarely necessary, and the use of thyroid as a routine measure is to be deprecated.

3. *Puberty to Adolescence.*—Even after puberty is well established a few children, chiefly girls, remain over-fat during their last years at boarding-school. We hear much of the woes they are supposed to suffer from the taunts of their school-fellows, but this is quite exceptional. Usually these fat girls are very popular and are jolly, happy, and prosperous folk. The great difficulty is to get them to take the slightest interest in their weights or figures while they are at school; it is usually the parents who are anxious. Such cases will have sometimes to be dieted even while at school, and this needs to be done carefully. The girl will be probably leading a very active life and may be working for examinations, and if the diet is so restricted that she is perpetually hungry her work will suffer and she will be rendered miserable and bad-tempered. The fats and carbohydrates in the diet must be ruthlessly cut down, and the girl fed on proteins with plenty of green vegetables, salads, fruit and cheese, with bread substitutes and saxin. Such a diet, although dull, is not unpalatable. Its chief drawbacks are the absence of bread and butter, and the fact that it cannot be varied by occasional feasts. Of it the child may eat, if not ad lib., at least enough to be satisfied.

4. *Adolescence.*—After leaving school the adolescent who is over-weight generally becomes interested in her appearance and if then she slims sanely all is well. Occasionally, however, the slimming process gets altogether out of hand and the girl reduces herself to a condition of physical exhaustion and nervous prostration. Such cases are all very much alike, the patient swearing that she feels well and that she is better and happier on the restricted diet; but her cold extremities, her slow pulse, her excessive emotionalism and bad temper belie her words. Although she starts on the process of slimming volitionally it seems to develop into an hysterical obsession, and the ultimate state of the patient may give rise to real anxiety. In the treatment of such cases it is important that sooner or later the girl should be made to face up to the reality of her condition and the unwisdom of such underfeeding, for she is not cured in any real sense until she takes a natural amount of food for natural reasons.

(*Continued from previous page*)

damp, and unhealthy houses which are huddled together. Even in State-provided houses, as in labourers' cottages, there are many instances of overcrowding, a new generation having sprung up since any appreciable effort in housing has been made. So short is the supply of houses that many people are forced to occupy houses at rents far beyond their means. Dr. Harbison knows that many families are paying rents of 10*s.* to 15*s.* per week out of a total weekly income of 25*s.* He makes a strong case for town planning which "has a biological significance as well as a structural and economic one."

RECENT WORK ON VISCERAL SENSIBILITY

(PROF. SAMSON WRIGHT)

I HAVE selected the subject of visceral sensibility to talk about because it deeply interests both myself as a physiologist and you as clinicians; it is not an easy problem for either of us to study because experiments on animals suffer from obvious limitations, and observations made in the course of disease are often difficult to interpret. Experience has shown that individual organs must be investigated separately as there are few conclusions that apply equally to them all. I believe that a good deal of the present confusion is due to the hasty attempts which have been made to argue by analogy from one viscus to another.

You are all familiar with Mackenzie's studies on the heart. He showed that certain disorders of the myocardium are associated with no local or visceral pain, but give rise to referred pain in the distribution of certain posterior nerve-roots. As far as we know the cardiac pain-afferents enter the upper thoracic posterior nerve-roots only, but it is well recognised that the pain may be much more widely distributed and be felt in the neck or jaws or abdomen. I have suggested that this phenomenon be called "sensory irradiation," and there is some evidence that the extent of the irradiation may be related to the severity of the heart lesion. The pain-afferents are thought to produce some obscure change in the spinal cord to set up a so-called "irritable focus" which modifies the character of the impulses entering from the skin and muscles in the disturbed segments and so produces tenderness. Lastly, reflex motor effects like intense muscular contraction (thoracic constriction) or salivation may occur. The work of Lewis on the production of pain in an ischæmic-exercised limb seems to prove that muscular activity liberates an agent—the so-called P-factor—which can stimulate sensory nerve-endings and arouse pain. He believes that under normal conditions of the circulation the P-factor is removed as rapidly as it is formed, and never accumulates to threshold concentration; but if the circulation is inadequate it is retained in the tissues and pain results. When a tissue breaks down as a result of infarction the same factor is probably produced. It seems pretty certain now that typical cardiac pain is always produced by ischæmia either absolute or relative—that is by coronary thrombosis or by a coronary flow which is inadequate for the current needs of the heart—and that Lewis's chemical factor is the stimulating agent at work.

I would now like to draw your attention to some very convincing and illuminating experiments which have been carried out in recent years by Capps in America and which I think have greatly increased our knowledge of the sensibility of the serous membranes—the pleura, pericardium, and peritoneum. His pleural studies have been carried out as follows: In cases of pleural effusion he pushes a hollow trocar through the chest wall into the pleural cavity; before much fluid escapes a long stiff silver wire is passed through the cannula and brought into contact with various aspects of the pleural membrane. He found that the *visceral* pleura which lines the lung is entirely devoid of pain sense. Pressure on the *parietal* pleura, however, gives rise to a sharp pain which is located with considerable accuracy over or near the site of stimulation. The sensory nerves involved are of course the intercostals which richly supply this region of the pleura. His most interesting observations were made on the *diaphragmatic* pleura. As you know, the central part of the diaphragm is supplied by the phrenic and the afferents from this region enter mainly the third and fourth cervical posterior nerve-roots; the peripheral part of the diaphragm is supplied by the lower intercostals and the afferents pass into the seventh to the twelfth thoracic posterior nerve-roots. Stimulation of the diaphragm never produces local pain; it is always referred. From the central diaphragm the pain is referred to the neck and the upper part of the shoulder; from the peripheral diaphragm to the lower thorax, the lumbar region, or abdomen. The stronger the degree of pleural stimulation the more widespread is the distribution of the referred pain, and it may sometimes extend to the *other* side of the body too. Furthermore, the pain is associated with *tenderness* and *muscular rigidity*. I think you will agree that this work on the diaphragmatic pleura forms a most convincing demonstration of the general truth of Mackenzie's notions.

In the case of the pericardium, however, the findings are rather different. The lower part of the fibrous pericardium is supplied by the phrenic and gives rise to referred neck pain, but the inner surfaces of the pericardial sac are seemingly painless. Capps suggests that when severe pain accompanies pericarditis it is due to one of three things—involvement of the mediastinal tissues or of the diaphragmatic pleura or interference with the coronary flow.

The findings in the case of the peritoneum are identical with those with the pleura. The visceral peritoneum is insensitive; the parietal peritoneum gives *localised* pain associated with tenderness and muscular rigidity; the diaphragmatic peritoneum gives rise to referred pain in the neck or lower part of the body wall.

You must remember, however, that the hollow viscera are not insensitive to all stimuli. Pain can be set up by pressure changes which may result either from excessive distension or violent contraction of the muscle wall. There is still much dispute whether the pain is felt vaguely *in* the affected viscus or is referred to the surface of the body; most people, contrary to Mackenzie, hold the former view. The evidence suggests that so long as the disorder is limited to the viscus or to its visceral peritoneum there is *no tenderness or rigidity*. These latter symptoms only develop when the parietal peritoneum is affected. This matter I believe still requires much investigation and its practical importance is obvious; it is eminently a problem which you are fitted for and have the opportunities to clarify.

HORMONE THERAPY IN GYNÆCOLOGY

(MR. LESLIE WILLIAMS)

THE hormones of most practical value in gynæcology are œstrin, progestin, and prolan B.

ŒSTRIN

Let us consider *œstrin* first. Secreted by the ovarian follicles, it has a periodic stimulant action on the endometrium of the uterus, greatest in the first half of each intermenstrual phase. But it also has a vegetative action on the growth of the genital organs. This is seen particularly at puberty, when, in consequence of the development of egg-bearing follicles and the appearance of œstrin, the genital organs grow from the infantile to the adult condition. Hence we can at once visualise two therapeutic uses for œstrin: (1) to initiate or restore the normal menstrual cycle; and (2) to bring about development of organs which are under-developed.

One must realise, however, that to produce real effects with ovarian hormones, we must use much bigger doses than was at first envisaged. When I was associated (in the minor capacity of operating surgeon) with Parkes and Zuckerman in their experiments with œstrin, I was able to see at first hand the evidence that enabled Parkes to calculate that, from the weight of the adult woman as compared with the weight of a baboon, the dosage necessary for the adult woman would be in the neighbourhood of half a million mouse units. This surprisingly accurate forecast has been, as we shall see, strikingly corroborated by the work of Kaufmann.

Now 500,000 mouse units of œstrin, as it was then prepared, was an extremely costly dose and the next step towards the effective use of the remedy came from the chemists, the most valuable work in this country being contributed by Prof. E. C. Dodds. The first compound isolated in the crystalline form was found by Doisy and proved to be keto-hydroxy œstrin. All sorts of derivatives were developed and investigated, and among the few I need mention here comes di-hydro œstrin, which is produced by hydrogenation of œstrin. This substance is five times as active as keto-hydroxy œstrin and one gramme of the crystalline substance equals 50 million international units, as compared with 10 million for the keto-hydroxy œstrin. The manufacturing chemists have supplied an oily solution of di-hydro œstrin benzoate in ampoule form, each 1 c.cm. ampoule being equal to 250,000 international units.

This di-hydro œstrin is allied chemically to certain hydrocarbons containing the phenanthrene ring, some of whose derivatives are cancer producing—as in tar cancer. And we may think for a moment on the similarity between œstrus manifestations (e.g., squamous-celled proliferation in the vagina) and the formation of cancer. But we have been reassured that carcinogenesis is not a practical likelihood from the use of œstrin derivatives supplied by the various firms of chemists.

Through the work of such firms as British Drug Houses, Organon, and Schering, we now have, available for therapeutic use, œstrin in convenient bulk for administration in doses of 1000, 10,000, or 100,000 international units. At the same time one cannot help regretting the fact that there are on the market all sorts of preparations with wonderful names, but without any clear indication of the dosage in any standard unit, and without any accurate indication of the specific hormone on which their action is supposed to depend. For myself I can see no value in such preparations and do not think any useful advance in knowledge or in therapeutic benefit will come from their employment. Furthermore, it must be remembered that oral administration of even the best of the hormone preparations is about one-thirtieth as effective as intramuscular injection. As for the dry gland preparations (except thyroid), and the plurigland blunderbuss tablets, and so forth, they are, relatively speaking, useless.

And now to the consideration of the practical use of hormone preparations. Perhaps the most striking case is that in which menstruation has been restored in a woman who has for some reason or other developed secondary amenorrhœa. Kaufmann of Berlin has produced the most notable work on this subject and he says categorically: "with few exceptions I succeeded in producing true menstrual bleeding every time in 40 patients." By true menstrual bleeding he means normal menstruation from a normally proliferated endometrium as demonstrated by curetting. His technique is to give on the first, fourth, eighth, eleventh, and fifteenth day of the month 250,000 international units of œstrin. Then a pause of three days. Then 7 rabbit units of corpus luteum hormone (progestin) daily for five days. Menstruation should start a day or so later and can be expected with fair confidence even in a castrated girl.

At St. Mary's Hospital we have not been quite so successful; but about half the cases have responded favourably. Here we do not give the full treatment as recommended by Kaufmann but, following the suggestion of other workers in this country, have reduced the dose of corpus luteum hormone from 7 to 1 rabbit unit.

Now what happens when treatment is stopped? In the castrate woman as a rule nothing; but in the case of secondary amenorrhœa regular spontaneous menstruation may take place for several months. Where there has been severe or prolonged disturbance of the ovarian cycle it is preferable to give the treatment over two or three months, and even then amenorrhœa is likely to reappear after perhaps a few months of normal menstruation.

In young women who have had the misfortune to be castrated it is of course unnecessary to produce menstruation if the aim is merely the relief of their symptoms. Such women may have very severe "flushes," sweats, and the like. In these cases and in women who have severe menopausal symptoms at the natural age, it is said that most striking therapeutic results can be secured. In such circumstances Kaufmann recommends big doses for the first two weeks, 500,000 international units to be given twice weekly. Then the dose should be reduced to 100,000 units weekly. And, I imagine, still further reduction could then be tried. After three months this treatment is suspended.

One other menopausal symptom occurring either in castrate women or after the natural menopause and deserving of individual consideration is itching. This symptom, occasionally so very troublesome, may be vulval or general, and usually responds well to treatment with œstrin. The first few doses, however, may aggravate the condition. So be prepared for such a temporary set-back and continue with the treatment. But you must give big doses. I suggest that 100,000 units of some preparation of œstrin be given twice weekly. Even without making use of these massive doses, many menopausal cases improve considerably on doses of 10,000 units of œstrin weekly. Flushes particularly are greatly benefited and mental depression often relieved.

My next mention of œstrin for therapeutic purposes is in reference to scanty menstruation in young women. Œstrin in doses of 250,000 international units should be given on the third, sixth, ninth, and twelfth days following a period—i.e., in the proliferative phase. Kaufmann states that "if during treatment normally marked bleeding is produced, then, after an average of three courses of treatment, we may expect bleeding to remain normal after the cessation of treatment."

Œstrin has also been used in attempts to induce labour, but is not valuable for this. But Leyland Robinson and his colleagues report (Brit. Med. Jour., 1935, i., 749) that it is extremely useful in preparing a uterus which contains a carneous mole or a dead pregnancy to respond to the stimulation of pituitary extract and quinine and so to expel its contents. For this purpose they treated cases with doses varying from 100,000 to 3,000,000 units of œstrin and about four days later gave the quinine and pituitary.

Their results were satisfactory and their findings suggested that œstrin may perhaps prove useful in the treatment of primary uterine inertia. But it is too early to speak of this yet. Œstrin is also suggested for vomiting of pregnancy and 10,000 units three times a week has been indicated as a suitable dosage.

Sterility and menstrual headache have been spoken of as responding to treatment by œstrin, but I have no personal experience of this. But I have tried it for vulvo-vaginitis in young children as suggested by Nabarro and Signy in THE LANCET of March 16th, 1935, and thought that it did good.

It may have been noticed that though I have dealt with reproduction of menstruation in cases of secondary amenorrhœa, I have not mentioned œstrin and progestin therapy for primary amenorrhœa and genital hypoplasia. If anybody desires to treat such cases, the technique for the treatment of secondary amenorrhœa is adopted and is repeated over and over again. But it is a long and a tedious and expensive business.

PROGESTIN

Another therapeutic use of the ovarian hormones is that of the *corpus luteum hormone* for the control of irregular or excessive uterine hæmorrhage. We used to call this hæmorrhage the result of "endometritis," but we now believe it is due to cystic hyperplasia of the endometrium resulting from excessive œstrin production. The modern conception is that the ripe and ripening follicles fail to rupture, and so fail to become converted into corpora lutea. Therefore they continue to produce œstrin in excess and no "progestin" appears. This endometrial condition can be produced experimentally in castrated women, but very large doses of œstrin are required—about 5 million units spread over eight weeks. And to cure the experimental condition thus produced, very large doses of corpus luteum hormone are required—up to 90 rabbit units. Clinically, however, smaller doses work well and 20 rabbit units, spread over six days, may be expected to succeed.

Therefore the obvious clinical treatment is to give corpus luteum hormone, and on Kaufmann's recommendation 15 rabbit units spread over five days may be taken as a reasonable standard. However, some cases do not respond to large or small doses. These cases appear usually to have a large follicular cyst, resection of which may reasonably be entertained.

This is a convenient moment to mention the difficulty that the clinician experiences when dealing with all these "units." Roughly speaking one rat unit = 5 mouse units = 25 international units. But unfortunately this is by no means always true, since certain hormones standardised first against mice and then against rats will not conform to the above standard. And rabbit units are different again! So the clinician is compelled to memorise arbitrary doses of so many international units for this and so many rabbit units for that and so on. Personally I find it all very difficult. To illustrate this, I have already given Kaufmann's recommendation for the treatment of cystic endometrial hyperplasia causing menorrhagia. For the same condition the Organon firm recommend only "five rabbit units spread over several days just before the flow is expected." And, as we shall see, another line of treatment is to give not corpus luteum hormone itself, but the anterior pituitary hormone which stimulates the production of corpus luteum which is usually standardised in rat units.

After this digression I must return to the corpus luteum hormone. In addition to menorrhagia, cases of habitual abortion do very well under this remedy. Of course it is necessary to eliminate any cause such as syphilis, nephritis, a badly retroflexed uterus, or an extensive cervical tear. And one must give the necessary advice as to avoidance of muscular effort, coitus, &c. But when this is done cases which have had a series of miscarriages can often, I might say usually, be brought safely to term by the bi-weekly intramuscular injection of 1 rabbit unit of corpus luteum hormone from as early a date in pregnancy as possible to the thirty-second week. We have found it advisable to stop the injections then, since otherwise some women see fit to try to prolong the period of gestation beyond the normal 40 weeks.

PROLAN B

But it is expensive. Each ampoule (of 2 rabbit units) costs about half a guinea and in view of the expense, and because until recently corpus luteum hormone preparations were unreliable and badly standardised, we at St. Mary's have been using as an alternative the *gonadotropic hormone* from the anterior part of the pituitary gland. We have aimed at using prolan B, but nothing can be gained from discussing whether this is radically different from prolan A. The commercial preparations we have used are Antuitrin S (Parke Davis) or Pregnyl (Organon).

We have treated a large number of cases of habitual miscarriage with antuitrin S with most gratifying results. Our dosage has been 1 c.cm. intramuscularly twice a week. Now it is believed that antuitrin S loses its activity very rapidly and our success may have depended on the large number of cases treated requiring constantly renewed supplies of the preparation so that it was always fairly recently prepared. For the practitioner using it only occasionally antuitrin S cannot be recommended since it is probably inert after a short time of storage. It may be shown by experience that pregnyl is therefore preferable for use in individual cases since its preparation and method of dispensing make for the retention of its active properties. If therefore any of you propose to try pregnyl for any cases of habitual miscarriage without any ascertainable cause, I recommend you to give 30 rat units intramuscularly twice weekly at first and to increase to 100 such units if no unpleasant symptoms are produced. Let the treatment be started as early in pregnancy as possible and be continued until the thirty-second week. And now let me refer to the use of gonadotropic hormone as an alternative to using corpus luteum hormone in the treatment of menorrhagia in women of, say, 35 years of age. A suggested line of treatment is 100 rat units of this type of hormone (say pregnyl) intramuscularly three times in the ten days before a period and 30 rat units daily during that time.

Finally cases of spasmodic dysmenorrhœa may be presumed to be due to excessive and colicky uterine action. Theoretically uterine contractions should be diminished by the action of the corpus luteum. Therefore it has been recommended that cases of dysmenorrhœa in young women should be treated by the administration of corpus luteum hormone in doses of, say, 2 rabbit units two days before the pain and repeated on the first day; or the corpus luteum stimulating hormone may be used e.g., pregnyl 30 rat units daily, starting two days before the pain is expected.

SUMMARY

To *recapitulate*. (1) For severe menopausal symptoms in a young oöphorectomised woman: 500,000 international units of œstrin twice weekly reduced later to 100,000 units weekly. Stop at the end of three months. (2) For less severe menopause cases: 10,000 units of œstrin weekly. (3) For itching at the menopause: 100,000 units of

œstrin twice weekly. (4) For scanty menstruation in young women: 250,000 units on third, sixth, ninth, and twelfth days following a period. Three courses of treatment in all. (5) To induce labour in cases of retained dead pregnancy: 500,000 units of œstrin split into 5 doses with intervals of eight hours followed four days later by quinine sulphate, 3 doses of ten grains at hourly intervals, and 0·5 c.cm. of pituitrin, 4 doses at hourly intervals. (6) For vomiting of pregnancy: 10,000 units of œstrin thrice weekly. But I have no personal experience of the results of this treatment. (7) For "metropathia hæmorrhagica"—a period of amenorrhœa followed by prolonged profuse uterine hæmorrhage—and for menorrhagia in young women: 15 rabbit units of corpus luteum hormone spread over the five days before a period if there is any regularity, or given during the time of hæmorrhage in other cases. Alternatively: the gonadotropic hormone preparations such as pregnyl, 3 or more doses of 100 rat units, in the ten days preceding the flow (if regular) or 1 c.cm. of antuitrin S twice weekly. (8) Habitual abortion: 1 rabbit unit of corpus luteum hormone or 1 c.cm. of antuitrin S twice weekly from say the eighth to the thirty-second week of gestation. As an alternative to antuitrin S, the preparation pregnyl, 30 rat units twice weekly, increased to 100 units twice weekly if no unpleasant symptoms are produced. (9) Spasmodic dysmenorrhœa: corpus luteum hormone, 2 rabbit units two days before the pain and 2 more rabbit units at the onset of menstruation. Alternatively, one of the prolan B preparations (gonadotropic hormone) 30 rat units daily, starting two days before the pain is expected.

OPENING OF THE MEDICAL SCHOOLS

THIS week has seen the beginning of the academic year at some of the schools of medicine and allied sciences in London. Below we print extracts from Sir Gowland Hopkins's address to students at the College of the Pharmaceutical Society, and from "Ian Hay's" address at Westminster Hospital.

PREPARATION OF THE PHARMACIST

BY SIR GOWLAND HOPKINS, O.M., F.R.C.P., P.R.S.
PROFESSOR OF BIOCHEMISTRY IN THE UNIVERSITY OF CAMBRIDGE

THE more responsible the calling the higher should be its standards, alike in education and in practice, and British pharmacy is surely fortunate in possessing, in the Pharmaceutical Society of London, a representative body of which the aim—to-day so successfully fulfilled—has been to maintain standards which make for the dignity of the calling, and earn for it the respect of the public.

I would like to speak first in praise of the Society's educational policy, of which the thoroughness and efficiency are remarkable. The standards it imposes are undeniably high, and I am aware that there are some at least who, placing emphasis on the special conditions in which the average pharmacist in this country practises his calling and the peculiar commercial services which the British public is accustomed to expect from him, maintain that such extensive educational demands—on the scientific side at any rate—may outrun the needs of practice, and impose an undue burden on the efforts and time of the beginner. If among my audience there chance to be any who take this standpoint, I hope they will bear with me while I advocate a view which is entirely different.

Educational problems as a whole are, of course, too big to be discussed here; but there is an aspect of policy I would like you to consider as being of importance in the general tenor of my remarks. How soon should the vocational element enter into educational courses? It is often urged that the true function of education is to train the mind to think rightly rather than to store it with facts. There is of course much truth in this, especially in the case of children and adolescents. But technical or vocational teaching has to follow at some moment, and the greater the knowledge required for a chosen career the longer the time which must be spent upon it. Vocational needs must not make the teaching of a science so one-sided that the student risks missing the intellectual stimulus which the great generalisations of science provide. I am personally sure however that the skilful teacher of students whose ultimate aim is to apply science in practice can illustrate general principles adequately while selecting facts and aspects which have a permanent vocational value.

For the encouragement of the average student it is important that the reality of this permanent value should be part of his faith. I have been in touch with medical students for more than half a century, and have taught them for a great part of that period. Throughout I have realised, as every teacher of the pre-clinical sciences has to realise, that save for a select group, which one must admit is growing larger to-day, medical students are convinced that the three years spent on their pre-clinical studies represent a painful delay in their approach to realities, which only come, they believe, when contact with patients is reached. I have no doubt that many students of pharmacy, though their ultimate aims are different, have analogous feelings. This attitude is after all based on an innate characteristic of the Anglo-Saxon race which loves action better than thought, and practice better than theory. It is a quality which has served the race well politically, for in politics and national adventures it is character that counts, and, as we were long ago reminded, action may be hampered by the "pale caste of thought." But this same quality has sometimes kept us from being in the van of intellectual, and, no less, of commercial progress. It was because it had become really scientific that the medical knowledge of another country received for a long period, and up to the time of the war, the greatest respect of the world, and it was because its chemists were so thoroughly trained in theory that the same country obtained, among other similar advantages, a long lead in the production of synthetic drugs, which, rightly or wrongly, brought it enormous profits. That same country has now replaced its former respect for intellectual effort by the crudest form of nationalism, which ignores the claims of the intellect. We ourselves can profit just now in some activities quite legitimately by cultivating the earlier enthusiasms of that country while it is otherwise engaged.

All that I have so far said has been in preparation for a more succinct statement of certain articles of my personal faith.

First I believe that for the student of pharmacy, no less than for the student of medicine, the chief

gain from the science teaching which must precede practical activities is in the scientific attitude of mind which it creates, and in the special intellectual background it provides which, even when a mass of detail is forgotten, remains a valuable possession. But I also believe that when teachers and examiners are wise, this most desirable result can be obtained by teaching which is essentially vocational, and largely confined to aspects of scientific knowledge which are of permanent and practical value.

A more recently acquired article of faith with me is one which the present occasion has established. I have been reading the educational pages in the Society's calendar, and, while recognising my limitations as a critic, I feel justified in my belief that those pages reveal a policy based upon sound judgment. The syllabuses provide, in my opinion, just that amount of vocational reference which is so encouraging to the student, without lowering the intellectual value of the courses.

I certainly find myself among those who wholly approve of those additions which are now about to take their place in the curriculum. That the biological teaching should at this time be extended on its animal side is only logical. When vegetable drugs and preparations of vegetable origin bulked so largely in the pharmacopœia, the prominence of botany in the curriculum was justified. With the immense development of glandular or hormonic therapy conditions have altered. It is clearly desirable that all who may have concern with the preparation and the standardising of organic therapeutic preparations and the distribution of the countless proprietary preparations of this class, should possess, no less than those who prescribe them, an adequate knowledge of the nature and functions of the various organs from which they are derived, as well as of the bodily functions they control.

Scarcely different is the case of vitamins; indeed it is nearly, if not quite, justifiable to look upon a vitamin as a hormone which the body cannot make for itself, or on a hormone as a vitamin which it does make for itself.

The trouble indeed for all of us who, from any standpoint, have to think about or deal with hormones and vitamins, whether as physiologist, biochemist, clinician, or pharmacist, is the present great complexity in the facts concerning them. Knowledge concerning the control of the body by a multiplicity of hormones with complicated inter-relations is growing daily, and the literature dealing with research on vitamins has of late contained as many as a thousand papers in a year. Only the specialist can deal with such an output; but the fact that substances of the kind are intruding into therapeutics in such an overwhelming way makes it highly desirable that the pharmacist should be aware of the essential facts relating to their origin, distribution, and action, as well as full acquaintance with their chemical properties. It is for this reason that I think the introduction of animal physiology into the courses of the college is so justifiable and so timely. In thus widening the ground of study those responsible have shown themselves to be courageous as well as wise.

Students who are about to begin their college courses may be feeling to-day that they have heavy tasks ahead; but one may remark here that all who hereafter obtain a major qualification in pharmacy will have whatever satisfaction is involved in knowing that the difference between their own scientific training and that of the average medical student is approaching a vanishing-point.

I suppose that any who harbour doubts concerning the practical value to the pharmaceutical calling at large of a somewhat exacting scientific curriculum may also be inclined to think that the encouragement of research is something remote from the Society's essential functions, and may even feel that the expenditure it involves is not justified. If that view has to-day any supporters I should be very happy if any words of mine could modify it.

I am one of those—and they are many—who believe that in every centre where science is taught research should be active. It is no theoretical view, but a belief based upon wide experience that the pursuance of research within a department vitalises its teaching. It compels the teacher to keep in touch with progress, and keeps his mind alert. It creates an atmosphere from which every student directly and indirectly benefits. Where research is absent teaching is apt to become stereotyped, unprogressive, and, very often, dull. All concerned I think, whatever they may feel about the amount of college teaching to be desired, will wish that whatever is taught should be taught well.

Apart from this influence of research upon teaching, the publication of original work from any department awakens the interest of the scientific world in that department, makes it known and gives it distinction.

If anyone were inclined to say to me at this point "you have been speaking as an idealist, ignoring as idealists are apt to do the many problems and issues which dominate practical life," I should answer that policies which seem idealistic to-day are apt to become realistic enough to-morrow. In these times of social and economic changes only one prophecy can be safely made concerning the future of pharmaceutical practice in this country—namely, that it too will suffer changes.

Many of the younger members of the calling look, I am sure, to its becoming, in a more complete and secure sense than now, a profession. If trade be a calling in which material goods are sold and a profession one in which knowledge is sold—and this seems to be one essential difference between them—then I am sure that the professional side of pharmacy is fated greatly to increase in this country.

It is difficult now as always for those who serve the public to avoid supplying it with what it demands. The general public to-day, and not its humbler sections alone, is for the most part too ignorant to be protected from the influence of the advertisements incessantly before its eyes, which proclaim the supposed merits of a crowd of quack nostrums or expensive proprietary articles of little real value. There are many individual pharmacists to-day who I know do their best to protect it from such, and there are committees in being to-day which are considering possible remedies for the evil. But the problem involved in combating it, whether by State action or otherwise, is an extremely difficult one, as all who face it come to realise.

But biological science is gaining a foothold in general education. It is beginning in schools and is increasing its influence in the universities. The time is not far distant when even average members of the community will know much more about their bodies and their bodily functions than they know to-day, and will no longer display the faith which is born of ignorance. When ill they will of course go to the medical man for diagnosis and for guidance, but I believe that there are matters concerning which they will seek knowledge from the pharmacist to an increasing extent, knowing that it will be knowledge based on scientific truth.

I will even venture to suggest that owing to the increasing specialisation in knowledge and its applications which modern progress demands, the future may see certain readjustments in medical practice which will make it easier for the British pharmacist to assume that more definitely professional status which he now occupies in certain other countries. I touch here, however, on difficult and delicate ground. It would be idle to speculate further on lines such as these; we can but very imperfectly foresee the march of events. But of this I am sure: the status of practical pharmacy in this country will rise with the rise in its standards of education.

THE PRIVILEGED PROFESSION

By Major John Hay Beith, C.B.E., M.C.

I CANNOT help feeling that to-day human relationships are in the melting-pot. The world is being dehumanised: everywhere the machine is taking the place of the man—or, worse still, the man himself is being practically turned into a machine. From sausages to motor-cars and from motor-cars to wrist-watches, things are now manufactured by a subdivision of labour so elaborate that a man's daily work consists in making one simple muscular movement thousands of times over. To the man that means two things. It makes it unnecessary for him to learn a skilled trade, so that he is deprived of the character-forming processes of education; and it takes away from him the only true incentive to labour, the only true reward of labour—the pride of the creator, the joy of seeing a piece of work begun, continued, and ended by one's own hands. That is gone, and with it has gone a certain percentage of the romance of life and of the humanity of the human family.

How far are these modern tendencies going to affect your profession? How much is the art of healing going to be affected by such things as the mechanisation of human life and the inevitable reactions which must follow in its train?

To that I should reply, very little—less than in any other profession perhaps—and for certain definite reasons.

The first and most important reason is that you cannot mechanise medicine—or surgery, for that matter. The human material upon which you have to work presents too many variations. Your domain will be the very last for the robot to conquer. We shall never see an operating theatre, for example, run on the lines of a Chicago meat-packing establishment—a row of eminent surgeons each making one cut in a different place!

Secondly, you are comparatively immune from the craze for self-expression—or self-advertisement—which is the natural consequence of these tendencies, because you have always safeguarded yourselves as a profession against that kind of thing. It is a sacred tradition of your calling that an individual member of it must never seek personal publicity, or advertise himself in any way. Marvels of successful research may be achieved, miracles of healing may be performed, but the credit will go, as it always has gone, to the profession as a whole and not to the individual—just as in the Great War the British flying men, whenever a battle in the air was won, chalked up the achievement not to the account of this pilot or that, but to the greater glory of the Royal Air Force as a whole. That is a noble tradition. Of course, if a medical man feels the urge for publicity too strong for him, he has his remedy; he can always go to the market-place and extract teeth or sell quack nostrums to the music of a brass band. But he must go outside the profession to do it.

And then thirdly, the medical profession is one of the few where efficiency and thoroughness, and nothing but efficiency and thoroughness, count. There are no substitutes. In commerce we are told it pays to advertise. That is true; if you advertise hard enough you can sell almost anything. But fortunately that sort of thing is no good to you. If a man dies under your hands, we'll say, by reason of your ignorance of your job, no publicity campaign in the world is ever going to persuade him that he is still alive. So that is that!

Still, as we have already agreed, professional efficiency is not quite everything. You must know not only how to heal people, but how to handle them as well. And here I may be able to give you a few hints. You see, I have never been a doctor, but I have occasionally been a patient; and I agree with you, right away, that patients are a most unreasonable tribe of people—a curse, in fact. You can divide them into many classes, but three will suffice here:—

1. People who are really ill. We need say no more about these, because they give little or no trouble.

2. Patients who are rather ill, but do not believe in doctors, and tell you so quite frankly. You know the man who says to his medical adviser:—

> "I only called you in because my wife insisted on it. I know as well as you do that the whole medical business is mere mumbo-jumbo; so don't start taking my blood pressure or doing any conjuring tricks with thermometers and stop-watches. I know how my inside works much better than you do, because it's my inside and not yours. You can leave me some medicine if you like, just to save your face; but I warn you I shall probably throw it out of the window."

That's the bluff, honest, hearty type of patient, the type that has made the name of Englishmen respected all over the world. Well, the simplest and most profitable way to handle this individual is to employ the soft answer. You say:—

> "My dear fellow, I agree with every word you utter. Of course, you are quite right; all medicine is nine parts faith and one part colouring matter. You and I both *know* that, so there is not the slightest use in my prescribing for you in the ordinary way. If I may say so, it is a treat to encounter a patient with whom a doctor can be absolutely frank—a patient who doesn't want things wrapped up in meaningless phrases. You, as of course you probably know without my telling you, are suffering from . . ."

Here you give the name of his disease—in Latin, two longish words, with a false concord thrown in. You add a few scientific terms about reflexes and secretions, and so on, and wind up, if possible, with an impromptu chemical formula. After that, he will simply eat out of your hand.

3. Then we come to a third class of patient—the patient who thinks he is going to die forthwith, if not sooner, and has to be cheered up—or, as they say in a bigger and brighter land than this, kidded along. In that connexion I cannot resist calling, or recalling, to your notice one of W. W. Jacob's stories about that immortal trio, old Sam, Peter Russet, and Ginger Dick. I want to read you an extract. Sam, you may remember, was taken ill.

> "And," continues the Night Watchman, who tells the story, "like most 'ealthy men who get a little something the matter with 'em, 'e made sure 'e was dying. 'E sent Peter out for the doctor, and in about 'arf an hour Peter

came back with a sandy-'aired young man with red eyelids and a black bag. 'Am I dying, sir?' ses Sam, after the doctor had listened to 'is lungs and 'is 'art, and prodded 'im all over. "We're all dying," ses the doctor—"only some of us'll go off sooner than the others." Peter and Ginger Dick took turns to be with Sam that morning, but in the arternoon the landlady's mother came up to look arter 'im a bit. She sat on a chair by the side of 'is bed and tried to amuse 'im by telling 'im all the death-beds she'd been at, and partikler of one man, the living image of Sam, who passed away in his sleep. It was past ten o'clock when Peter and Ginger came 'ome, but they found poor Sam still awake and sitting up in bed propping 'is eyes open with 'is finger."

Well, that's a good example of how not to do it. What a patient of any kind wants is to be reassured; and that is where technical knowledge will not avail you so much as a cheerful presence and a confident manner. And here, speaking from my experience as a patient, may I drop a hint to future G.P.'s? Humanity fears one thing above all others—the unknown. What frightenes a patient most of all is to have nothing definitely wrong with him. Once a definite cause has been assigned to his ailment, once you have hung a label on it marked in plain figures, and given him something physical to hold on to, he will endure almost anything. So if you can, be explicit with him upon this point, even though you may not have the slightest idea what is the matter with him. Tell him something—anything that will keep his imagination from soaring into the regions of unhealthy speculation. Anything will do; a man is never frightened of a thing he knows all about, or thinks he knows. It is a good plan sometimes to be symbolic—to illustrate the patient's condition, or supposed condition, by some mechanical analogy. You can refer to trouble in his engine-room, or explain that his dynamo requires tuning up, or his accumulators recharging, or that an overstrained spring must be relaxed. Something concrete like that—something he can bite on. Tell him that he has a Rolls-Royce body, but that his petrol pressure is faulty. That will cheer him up much more than to tell him baldly that his malady is functional and not organic. It is a strange thing, the amount of solid comfort a nervous person can derive from having his interior compared to that of a motor-car; but the comfort is there—especially if you tell him he's a Rolls-Royce.

In other words, a good doctor must not only be a good doctor, he must be a good propagandist. We need not go all the way with Samuel Butler, who tells a story somewhere of a man who swallowed a doctor's prescription in the belief that it was an actual medicine, and was immediately cured of an illness; but believe me, the personal touch does count, all the time.

Now I have rambled on nearly long enough. But before I sit down, I want to explain at last why I have selected this title, the Privileged Profession, for my discourse.

The reason is this. The doctor is a privileged person because he enjoys certain privileges denied to the majority of men. He is automatically and simultaneously not only his patient's professional adviser, but his personal friend. A layman may have professional contact with all sorts of professional people; and while respecting them in their professional capacity profoundly, he may dislike them intensely as individuals. I forbear to particularise, except to hint that perhaps you may sometimes be tempted to regard your family lawyer as a bore, or your rector as a bit of a prig, or your stockbroker as a dangerous crook. But nobody ever disliked his doctor. (I am not referring to dentists, of course.) If you are a man's doctor you are his friend too—and that makes the doctor's profession a unique profession.

The family doctor is a sort of Jekyll and Hyde—or better still, a sort of combined Laurel and Hardy. In one capacity he is just a friend and neighbour, with a golf handicap of 12 (which ought to be 15) and a quite incurable passion for going three no trumps upon an inadequate hand. He is just one of ourselves.

Of course we may be so healthy that the very existence of the healing art is entirely unrealised by us. But time will cure this. In the end, sooner or later, we all come to recognise the doctor's existence—and to discover him in his other capacity.

Now we behold a man transformed. Indeed, he is not a man at all; he is a divinity. We implore his presence; we hail his coming with gratitude and relief, as a frightened child hails the entry of some one into a dark room with a lighted lamp. He takes immediate and entire charge of the situation. He orders us about, and we obey his decrees without question and with trembling eagerness. His presence calms our fears, soothes our pain, and restores our hope.

In due course, when he has healed our sickness, or saved our child, and everybody is growing convalescent and fractious, he reverts to his former status—the status of an agreeable table companion, or an unreliable partner in a foursome, or an amiable gossip. In other words, he is just a neighbour again. But down at the bottom of our hearts remains, and always will remain, the memory of that hour when the black chasm opened at our feet, and we held on to his calm and steady hand and begged him to pull us (or somebody else) back to safety—and he did not fail us.

The doctor is one of our few indispensables in life. He launches us into the world. Upon our voyage therethrough he is periodically summoned on board to assist us in that most delicate operation known as "executing repairs while under steam." And when the end comes at last, and the failing machinery refuses any longer to obey the calls from the bridge, it is he who takes the wheel and pilots us with tenderness and skill to our last anchorage. That seems to me a rather fine privilege.

And there is one other, denied to most of us. In most trades and professions you have to establish your bona fides in some definite way. If you apply for a job, you must produce written references and testimonials. In business transactions people expect estimates and contracts. But if you are a doctor in this country you have only to put up a brass plate on your gate with your name and degree on it, and people will accept you as a matter of course. They will believe your diagnosis, swallow your medicine, and take the items of your bill on trust. They won't pay it, but they won't dispute it. And more than that. They will receive you into the intimacy of their family life; they will leave you alone with their wives and daughters, and entrust you with all that is domestically sacred to them, without question. What exactly does this signify? It signifies in the first place that an English medical degree and an English hospital training are good enough for anybody, and in the second that an English doctor is an English gentleman, anywhere. For generations that tradition has been passed down, and it is your privilege—your last and greatest privilege—to uphold it.

CORRESPONDENCE

FORCEPS

To the Editor of THE LANCET

SIR,—Mr. Wrigley has done a service in drawing attention to the danger of the long forceps commonly in use, but surely he goes too far in wishing to discard them altogether. He admits that in most of the cases where he applied forceps the patient would have delivered herself if left alone, and in hospitals such patients are usually allowed to do so. These are really normal cases, where the low forceps operation is employed to hasten the delivery.

During the year 1934, 211 cases of either contracted pelvis or occipito-posterior position were admitted to the unit of the Glasgow Royal Maternity Hospital, to which I am attached; 109 of these had a spontaneous delivery—a higher proportion than in Mr. Wrigley's series, which consisted presumably mainly of normal cases—with one stillbirth; 44 cases had Cæsarean section, with no stillbirth; and 58 had delivery by forceps with 7 stillbirths. There was no maternal death. The last group consists of cases of minor degrees of disproportion and of occipito-posterior position, where there is no clear indication for Cæsarean section, so that it will continue to exist despite antenatal care. Such cases need skilled intranatal care, which involves, in many, manipulation of the fœtus and delivery by long forceps. The delivery cannot be effected in such cases by short forceps. Although Mr. Wrigley states that "to-day there should but rarely be the necessity to resort to any but the low forceps operation, which consists in the lifting of the fœtal head past the perineum," he himself used the long forceps in one out of three occipito-posterior cases.

In the same period, 15 cases of "failed forceps" were admitted to this unit. In only three was Cæsarean section indicated in the early stages of labour. Three of the remaining 12 had a spontaneous delivery, and nine delivery by forceps. There were two maternal deaths and six stillbirths. These results compare very unfavourably with the hospital figures already quoted for a similar type of case, and show that the crux of the matter is skilled judgment during labour in each individual case. In the hospital group of 58 cases delivery was effected by forceps because of maternal or fœtal distress; in my opinion, delivery by the long axis traction forceps is the most efficient and safest treatment in this type of case, where the delivery could not have been effected by the short forceps. Mr. Wrigley advocates "the anæsthetisation of the patient and a thorough examination to ascertain the cause," but does not indicate the treatment in such cases where short forceps are useless.

His suggestion that the student should be instructed in the use of the short forceps for low forceps delivery is a sound one. It is most important for the student to be impressed with the necessity for post-graduate training before he is competent to deal with complicated cases.

I am, Sir, yours faithfully,

Glasgow, Sept. 28th. DUGALD BAIRD.

To the Editor of THE LANCET

SIR,—I was much interested in Mr. Wrigley's advocacy of the short curved forceps for dealing with that very large proportion of all forceps deliveries which is undertaken for delay in the second stage with the head on or partly on the perineum. I believe that the short forceps are now almost unknown in modern hospital practice, but among the voiceless general practitioners they must still survive, especially among those who, like myself, have inherited a family practice and the instruments that formerly pertained to it.

I have carried a pair of short curved forceps very like those figured by Mr. Wrigley for over 30 years, and regard them as perhaps my most precious instrument. I have used them on numberless occasions to terminate a tedious second stage when the pains are too weak to overcome unaided the resistance at the outlet in a reasonable time. They weigh one ounce more than Mr. Wrigley's, were made by Messrs. Muir and Thompson many years ago, and have square wooden handles beautifully fitted so that they stand boiling perfectly well. Each blade measures 9¼ inches from tip to the bottom of the handle. The handles are shorter and even more convenient, I think, than those of Mr. Wrigley's forceps, in that they have a broad square shoulder grooved with a space to allow a finger to hook over. They can be slipped on very easily in almost any position of the mother without the buttocks necessarily being brought to the edge of the bed and without any deep anæsthesia. Most of my cases have been conducted single-handed with the help of a nurse and a Junker's apparatus. At one time a foot bellows was provided to work this, but latterly more often the pumping of the chloroform has been kept up by the nurse while I am actually using the forceps.

Should the case prove deceptive owing to unsuspected resistance and elongation of a tightly fitting much-moulded head, it is easy enough to remove the short forceps and, if necessary, to apply the powerful axis-traction forceps, which I also carry, in their stead; but this, of course, is a far more formidable operation and not to be lightly undertaken. It is often better to wait.

I am, Sir, yours faithfully,

Hampstead, N.W., Sept. 30th. J. L. MORTON.

ARTIFICIAL RESPIRATION

To the Editor of THE LANCET

SIR,—In the leading article, entitled Artificial Respiration on the Spot, in your issue of July 20th, you deal very fairly with the subject, but omit to mention an old method that has been employed in drowning cases—viz., inversion of the body, which is often of use though it has been unaccountably condemned by some authorities. In the exhaustive Hunterian lectures on the various methods of artificial respiration (March, 1909) Sir A. Keith says, "The effects of inversion I propose to examine when speaking of postural methods." However, the subject seems to have been overlooked or forgotten by the lecturer as I can find no further mention of it. My attention was drawn to the method by the following case. Several years ago I had just left the swimming bath after my daily bathe when I was called back suddenly to attend to a woman said to be drowning in the adjacent women's swimming bath. I found that the patient was a full grown, heavily built girl subject to epilepsy, who had had a fit while swimming in the bath. It did not take long to get her out of the water and I do not think that she was submerged for many minutes. On being brought to the landing I noticed a good deal of fine froth round the mouth, and so I had the girl held up by

the feet, head down, for the froth to escape—quite a torrent. I was astonished at the amount. When it ceased I performed artificial respiration by Silvester's method, and soon had natural respiration established. I think that this was much facilitated and hastened by preliminary clearing the air passages. Schäfer's method cannot empty the passages of froth and water nearly as thoroughly as inversion, and the inspiratory movements begin by drawing water into the air cells.

After death from drowning the pleural cavities are usually found to contain a lot of water transuded from the lungs—probably mostly post mortem. In cases that recover, the same process probably goes on to some extent. What effect has this on recovery? Is the fluid absorbed more or less easily from the pleura than from the lung?

I am, Sir, yours faithfully,

Semaphore, South Australia. F. LUCAS BENHAM.

T.A.B. VACCINE FOR GONORRHŒA

To the Editor of THE LANCET

SIR,—I have been using T.A.B. vaccine and gonococcal vaccine intravenously for some years in the treatment of gonorrhœa, and should like, therefore, to issue a word of warning, for experience has modified my first enthusiasm. As the result of this experience I have found that:

(1) Only young adults of excellent physique should be subjected to the treatment.

(2) Such treatment should never be ambulatory. The patient must be confined to bed. This is mentioned but not stressed by Dr. Bartley.

(3) Severe headache and vomiting may be associated with the temperature produced.

(4) With both substances, but particularly with gonococcal vaccine, a negative phase may occur, and precipitate metastatic lesions rather difficult to explain away.

I personally, therefore, now use the method mainly in persistent chronic vesiculitis or prostatitis, and in the resistant urethritis that is occasionally met with in the female. In such conditions the results obtained are often most striking.

Pyrotherapy is such an extremely valuable weapon in our armamentarium that it would be a pity if its reputation were damaged by indiscriminate use.

I am, Sir, yours faithfully,

J. JOHNSTON ABRAHAM.

Queen Anne-street, W., Sept. 28th.

PLASTER TECHNIQUE IN TREATMENT OF FRACTURES

To the Editor of THE LANCET

SIR,—Mr. Pridie is to be congratulated on his clear and concise description of the methods used by Dr. Lorenz Böhler, of Vienna, in the treatment of fractures. After five years' experience of the non-padded plaster-of-Paris cast in the fracture services of Mr. Harry Platt at the Ancoats Hospital and the Manchester Royal Infirmary, I can testify wholeheartedly to those advantages which Mr. Pridie claims for it. On some details regarding the method of application and on the subsequent treatment, I find myself at variance with him, but these are of minor consequence. My fear lies in the possible inference that this is a method of great safety, which can be easily acquired from a written description, and is suitable for adoption by the general practitioner or surgeon who is called upon to treat an occasional fracture only. As pointed out in your editorial (Sept. 28th) the chief danger is "constriction of the limb." From our own experience we have no doubt that the introduction of the non-padded plaster-of-Paris cast has increased the incidence of circulatory disturbances of varying degrees of severity. This complication is usually, although not invariably, due to faulty technique. If not recognised immediately and suitably dealt with, it is certain to be followed by the most disastrous results. For this reason alone, I believe that for the present the method should be used only in the larger organised fracture clinics. The technique requires a long apprenticeship before it can be used not only artistically, but with safety to the limb of the patient. It will be remembered that the widespread practice of plating fractures in the smaller surgical centres ultimately brought discredit to this branch of surgery. We fear that the non-padded plaster cast may acquire an equal stigma.

The centralisation of fracture treatment in the larger hospitals is proceeding slowly but surely. Until such clinics are everywhere available, I am convinced that it would be wiser to refrain from advocating specialised methods, which, in inexperienced hands, are fraught with danger.

On the advantages of using a stock plaster bandage, such as the Cellona bandage, in preference to bandages made in the plaster department of the hospital clinic, we have an open mind. After a trial of the Cellona bandage in the fracture service of the Manchester Royal Infirmary, we are not yet convinced that it is cheaper or more effective than the bandages made under the direction of an expert plaster sister.

I am, Sir, yours faithfully,

H. OSMOND CLARKE.

Manchester Royal Infirmary, Oct. 1st.

LIPIODOL AS A THERAPEUTIC AGENT

To the Editor of THE LANCET

SIR,—Prof. Harrower's paper in your last issue interested me greatly, because I have recently observed a similar effect in a totally different type of case.

A woman, aged 50, was admitted to St. Mary's Hospital for Women and Children, E., as a case of syringomyelia and syringobulbia. The more striking physical signs were as follows: complete anæsthesia to heat and cold of the feet and legs, with little alteration of other sensation; almost complete anæsthesia of the front of the chest to painful stimuli and to heat and cold. (The anæsthesia here was so complete that the patient arrived at the hospital with the front of her under-vest covered with blood derived from a painless pricking with the pin of a brooch, which had come undone.) There were no notable trophic changes in the skin of the feet; and the gait was relatively little affected. Speech was coherent, but slow as the result of difficult articulation. There was slight anæsthesia of the face to pin-prick, but not to heat and cold. The only other striking sign was severe, right-sided ptosis.

The general characters suggested that this was not a true case of syringomyelia; and blood was sent for the Wassermann reaction. In the interval between the sending of the blood and the receipt of the report, a cisternal puncture was performed. This was done, partly to demonstrate the condition of the theca, and partly for the benefit of a class of students. There was no hope of a good therapeutic result in my mind at the time. The cisternal puncture was performed secundum artem, and 4 c.cm. of lipiodol were injected. Radiograms, taken with the patient in the erect position, showed almost the whole of the lipiodol at the bottom of the theca immediately, but there were small globules scattered about at different levels. As the lipiodol had fallen so well, the patient was put back to bed with only one pillow; and, apart from headache of moderate severity, felt little the worse the next day. The surprising finding was that, at the end of 36 hours, the right-sided ptosis had disappeared and has not recurred (two months), although, according to the history, it had been present for at least four months. Furthermore, there was now definite, although defective, appreciation of heat and cold in the feet.

The Wassermann reaction in the blood and cerebro-spinal fluid was strongly positive; and vigorous anti-syphilitic treatment has almost restored the patient to health.

Prof. Harrower attributes the improvement in his two cases to "a chemical inflammation superimposed on the chronic condition." Such an explanation might be applicable to the return of sensation in my patient's feet, but it will not explain the sudden disappearance of the ptosis. It would be most valuable if the mechanism could be elucidated.

I am, Sir, yours faithfully,

Park-square West, N.W., Oct. 1st. A. PINEY.

INFECTION IN SWIMMING BATHS

To the Editor of THE LANCET

SIR,—In your issue of Sept. 28th (p. 740) you refer to my closure of the swimming baths here on account of scarlet fever, and the following details may be of interest:

A violent outbreak of scarlet fever commenced about August 23rd, which was traced to a dairy in the borough, and from there to a certain farm where it was found that one of the milkers had been milking from August 21st–23rd (inclusive) with a very sore-throat, but no rash. On August 26th this milker's son was definitely notified as scarlet fever, and on swabbing the throats we found hæmolytic streptococcus Type II. in the milker, his son, and his wife. Hæmolytic streptococcus Type II. was also found in the milk, and in all cases of scarlet fever where the milk supply was the suspected source of infection, whilst in several other cases where the milk could be exonerated Type IV. was found. The number of cases notified was about 350, but from inquiries I have made the number of cases affected must have been close on 1500. Most of the non-notified ones had no rash. It therefore became apparent that there was a risk of such cases, on recovery, using the swimming-baths, and it was for this reason that the baths were closed on Sept. 12th.

I may say that the swimming baths have no proper system of filtration or chlorination. I am, of course, familiar with Dr. Alison Glover's work, but have had strong reasons to suspect the Chelmsford baths as giving rise to cases of sore throat in the past, and I felt that to allow bathers to use them in the present circumstances was not advisable.

I am, Sir, yours faithfully,

J. C. SLEIGH,

Sept. 30th. Medical Officer of Health, Chelmsford.

PANEL AND CONTRACT PRACTICE

Notification of Tuberculosis in London

THE London insurance committee has asked for a report on the number of deaths from tuberculosis in the county during 1930–33, and whether any (and if so how many) of such deaths were either first reported to the county medical officer by the death returns of the local registrar, or were posthumously notified. Should there be any substantial number the medical benefit subcommittee is to suggest measures to secure earlier notification. The mover of the motion drew attention to the fact that of the counties in England and Wales with the highest incidence of deaths from tuberculosis during the four years in question London is seventh, and as the six worst counties are all in Wales London has the unenviable position of the worst county in England. In 10 per cent. of deaths from tuberculosis, he said, the disease was notified posthumously; sufferers, he urged, should be removed from an environment in which they might be a danger to the rest of the community. A medical member of the committee pointed out some of the problems confronting doctors in relation to the notification of tuberculosis; another while supporting the motion thought that pulmonary tuberculosis should be regarded differently from other forms of tuberculosis in regard to possible infection.

In the four years 1930–33 the average death-rate from tuberculosis (all forms) in the administrative counties of England and Wales was 777 per million. The average deaths per million during the same period for the ten worst counties were: Merioneth (1348), Caernarvonshire (1333), Anglesey (1232), Cardiganshire (1078), Pembrokeshire (1043), Brecknockshire (1022), London (971), Glamorganshire (967), Durham (964), and Northumberland (941). London thus keeps company with seven Welsh and two north-eastern counties. But curiously the ten counties with the lowest death-rates are mainly in the south-east of England; they are East Sussex (628), Isle of Ely (627), Hertfordshire (623), Surrey (617), Oxfordshire (613), Buckinghamshire (605), Wiltshire (589), Rutland (583), Derbyshire (555), and Soke of Peterborough (491).

Comparing London with other county boroughs a less unfavourable result is obtained, for all the following had a death-rate per million of over 1350—viz., South Shields, Middlesbrough, Gateshead, Bootle, Liverpool, and Salford, while closely following them are Tynemouth, Sunderland, Newcastle-upon-Tyne, and Manchester with over 1250. All these boroughs, except perhaps Salford and Manchester, are seaports; three of the ten boroughs with the lowest death-rates are seaside boroughs—viz., Blackpool, Eastbourne, and Southport.

A Novel "Representation"

The London committee, upon the recommendation of its medical benefit subcommittee, decided to make a representation to the Minister of Health that the continuance on the medical list of a practitioner who is 85 years of age, and deaf, would be prejudicial to the efficiency of the medical service of the insured. The local medical and panel committee and the Minister had already concurred in action under Clause 4 (4) of the terms of service, and notice had been given to the insured persons concerned that the doctor was not in a position adequately to discharge his obligations under the terms of service. This is the first occasion, it appears, on which a representation has been made in such circumstances.

Employing Assistants

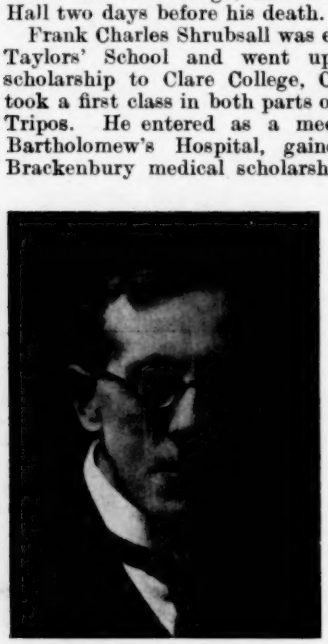
Clause 11 (3) (*a*) of the terms of service lays it down that a doctor shall not, except as a matter of temporary arrangement, employ an assistant to attend his insured patients without the previous consent of the insurance committee, which shall not unreasonably withhold its consent, and in no case without previous consultation with the panel committee. Should the two committees disagree the doctor is entitled to appeal to the Minister for a final decision. Two doctors recently applied for the consent of a committee in the Midlands to their employing assistants. The committee took the view in each case that the applicant ought to secure the services of a doctor as a partner and not engage an assistant in view of the number of insured persons for whom they were responsible and having regard to the distance between the residences and the surgeries. The panel committee was consulted and the doctors in due course complied with the committee's requirements.

OBITUARY

FRANK CHARLES SHRUBSALL, M.D. Camb., F.R.C.P. Lond.

Dr. Shrubsall, a senior medical officer to the London County Council, died at his home in Hampstead on Sept. 25th at the age of 61. His death came as a shock to his friends, for he had just returned from a holiday in Pembrokeshire reporting himself better for the change, and he was at the County Hall two days before his death.

Frank Charles Shrubsall was educated at Merchant Taylors' School and went up with an entrance scholarship to Clare College, Cambridge, where he took a first class in both parts of the Natural Science Tripos. He entered as a medical student at St. Bartholomew's Hospital, gained the Shuter and Brackenbury medical scholarships, and qualified in 1900. In the following year he became a member of the Royal College of Physicians and was elected to the fellowship in 1912, holding in the meantime house appointments at St. Bart.'s and Brompton. An only son and never robust, his health gave anxiety to his family from childhood and he was sent on several sea voyages. Thus early in life he came in contact with differing types of men, and this aroused in him that intense interest in the study of mankind which was to shape his career. In 1904 the British Association met at Cambridge and Shrubsall read a paper comparing the physical characters of hospital patients with those of healthy individuals from the same areas and making suggestions on the influence of selection by disease on the constitution of city populations. This paper not only revealed the bent of his mind and his exceptional gifts of observation, but assured him a position among British anthropologists, and he was elected a member of the committee on anthropometric investigation in the British Isles. He also became secretary to the anthropological section of the Association, an arduous post which he held for 18 years. The new developments in elementary schools initiated by the Education (Administration Provisions) Act of 1907 opened up for him a new and attractive field for scientific study, and in 1907 he read a paper at the Leicester meeting of the Association on anthropometry in relation to the school. At this time also he was lecturing on physiology and anatomy to teachers of physical exercises at the Chelsea Polytechnic, gaining the intimate knowledge of the theory and practice of physical training which helped to determine his life work.



DR. SHRUBSALL

In January, 1909, Shrubsall joined the band of brilliant young experts which Dr. James Kerr was forming to cope with the rapidly expanding medical services in L.C.C. schools. At first, engaged in the general work of the department, he found an outlet for his special knowledge in a mass of physical measurements of school-children already collected. These he collated and analysed, producing comparative figures of the physique of children in central and suburban areas of London. In 1910 he collaborated with Dr. Jane Gilmour, a Glasgow graduate, in an investigation into the ætiology of rheumatism which not only threw light on the distribution and characters of juvenile rheumatism in London, but led to the marriage of the investigators. The growing activities of the service demanding a measure of specialisation, Shrubsall found himself in charge of the L.C.C. special schools for the mentally and physically defective, the blind, the deaf, the partially sighted, and the hard of hearing. His department also included the reformatory schools under the Home Office. Under the Act of 1914 the L.C.C. became the local authority for mental deficiency, and the great volume of medical work falling upon the council in this connexion was naturally placed under Shrubsall's direction. Similarly, as he was associated with the training and after-care of blind children, the medical care of the blind generally which the Blind Persons Act of 1920 placed upon the L.C.C. came under his direction. And when Dr. James Kerr relinquished his service with the council his work connected with the health of teachers and with medical examinations of every kind at the County Hall was transferred to Shrubsall's department. On Sir John Collie's retirement the medical examination of the council's employees also came under his care. The Local Government Act of 1930 not only added enormously to the number of employees in the council's service, but also led to the transference from poor-law administration of large numbers of mentally defective, blind, and other persons.

Thus at the time of his death Shrubsall had charge of an immense volume of public work of the most responsible kind. His association with the development of the public care of mentally deficient persons from its beginning gave him an unique knowledge of this subject. To him the dull and the defective child constituted educationally one problem, and he was fully in sympathy with the findings of the government committee which was responsible for the Wood report, and which recommended the recognition of the two types as one educationally "retarded" group. He was intimately connected with the recent improvement of methods of care of "problem" children involved in the conception "child guidance." The calls upon his time for educational work on these subjects were very great. He was in constant request for evidence and assistance to government inquiries and advisory committees. He was lecturer in mental deficiency at the Maudsley Hospital; he organised the practical work of the courses in mental deficiency carried on in London for many years by the Central Association for Mental Deficiency, the Board of Education, and the University of London. He was required to give informative talks to associations of justices of the peace both in London and the provinces; he also lectured at the London School of Hygiene and Tropical Medicine. The call for information of this kind led to the preparation, with his colleague, Dr. A. C. Williams, of a text-book on "Mental Deficiency Practice." Shrubsall was one of the most widely travelled and deeply read of his medical contemporaries; he had in the course of his life visited nearly every country in the inhabited globe.

For his presidential address to the anthropological section of the British Association in 1924 at Toronto he returned to the subject which first made his mark 20 years before, but expanded it to include all humanity in time and space. It was entitled "Health and Physique throughout the Centuries," and epitomised his reading and thinking, his travels, and his own original researches, and it attracted much attention. In the years immediately following the war there arose a number of cases of delinquency among children of a new and startling nature. Social workers were puzzled. Investigation showed they were associated with attacks, often missed or misunderstood at the time, of encephalitis lethargica. All these cases, of which there were many hundreds, came under Shrubsall's own personal notice and enabled him in contributions to medical journals from 1925–27 to exhibit a clear clinical picture of the results of this disease.

One of those who worked with him writes:—

"Hampered as he was throughout his life by recurrent attacks of bronchial asthma, it is amazing that Shrubsall was able to do what he did in scientific research and public service. Humanity was his oyster which he opened, not indeed with sword or lancet, but with a penetrating understanding and an all-embracing affection. He was unsparing of self in his devotion to duty and in his numerous acts of kindness. His loyalty to his friends and his generosity knew no bounds. Where it was a question of giving help to a sorely tried colleague or friend the word 'impossible' did not exist for him. A sudden telephone call and a colleague was despatched to act as deputy in delivering a lecture, while he sped with his friend to see an ailing daughter and to restore peace of mind by wise advice and immediate action. His wide knowledge made him the most entertaining of companions. He loved to meet and learn at first hand from those who had done things in wild and foreign lands. He could take up the thread of conversation on any topic of real human interest and enrich it from his own store. His deep understanding of the springs of human action rendered him the most tolerant of men. Never did he sit in judgment. Where others would recoil in dismay from a case where disaster had been brought about by apparently disgraceful conduct, Shrubsall would see only an occasion for sympathy and help. His official duties brought him constantly into contact with anguish caused by illness or misconduct, and to innumerable human hearts he brought a measure of solace and relief in conditions where all comfort had seemed a vain hope. His love of humanity gave him the power of getting 'underneath the skin' of the most recalcitrant and obstinate of patients or delinquents and in the same way enabled him to make friends everywhere he went. It is recalled that during his student days he was working at a Swiss university for a time. On one occasion he was playing tennis with a partner who imperilled the game by poaching. He took her at last firmly by the elbow, led her to her proper position in the court, and indicating a circle with a sweep of his racket he admonished her with the words 'Sie müssen hier bleiben.' When his work was finished and it was time for him to leave, such was the affection and esteem in which he was held that the entire university assembled at the station chanting in unison as he entered the train 'Sie müssen hier bleiben.' A more recent recollection is of a small party of Scottish students on a fleeting visit to London, sitting in the restaurant at which he habitually lunched. They were very reserved and patently suspicious of their southern surroundings. In a moment Shrubsall had penetrated their reserve, put them at ease, and for half an hour he held them spellbound with lore of their own native Aberdeen. Himself the happy physician he brought happiness to others."

PUBLIC HEALTH

Paratyphoid Among a Hospital Staff

OF the typhoid group of diseases Prof. M. Greenwood remarks [1] that he knows no other illnesses in respect of which the evidence of man's theoretical and practical capacity to control them is so cogent. Nevertheless, he concludes, danger still lurks in wait and, in this matter of enteric diseases, central and local health authorities can never afford to relax their vigilance. In one of his yearly records of the state of the public health Sir George Newman pointed out that the major causes of enteric infections, such as polluted water-supplies, having been gradually eliminated there remained the more elusive and less easily controlled factors, such as carriers, contact infection, and contaminated foods. A recent outbreak of paratyphoid-B fever among the staff of the Ipswich and East Suffolk Hospital—for the details of which we are indebted to Dr. A. M. N. Pringle, medical officer of health for Ipswich—provides an apt illustration not only of the dangers which may lurk elusive in unexpected quarters but of the vigilance with which they are countered by the sanitary authority.

When the first patient, a member of the nursing staff, sickened on June 16th, the hospital contained 270 patients in the general wards and 30 in the pay-block. Of these 300 patients only 2 of those warded in the pay-block were infected. The personnel of the institution comprised 6 resident medical officers and 156 nurses, together with a domestic staff of 51 plus 24 day-women, and engineers and porters to the number of 19. The doctors provided 2 cases of paratyphoid fever, the nurses 21, the domestic staff 11, the day-women 1, whilst the engineers and porters escaped entirely. With 3 exceptions those affected were promptly removed to the isolation hospital. As Dr. Pringle says, the incubation period of paratyphoid fever is extremely variable, ranging from a few days to more than three weeks; not only so, but owing to the insidious nature of the invasion in many cases, it is difficult to define. He is satisfied, however, that the infective period in the hospital definitely dated between June 10th and 12th. Two cases, notably severe, occurred after an incubation period of 7 or 8 days; in 28 the period ranged between 9 and 14 days, and in 6 between 16 and 21 days. Dr. Pringle believes that the dates of onset point either to one massive infection or more probably to a series of infections extending at most over 3 days.

The food-supply of the hospital was common to patients and staff, and was cooked in the same kitchen by the same staff, the members of which remained unchanged throughout the month of June.

[1] Epidemics and Crowd-Diseases, London, 1935, p. 137.

The fact that no patients in the general wards were infected ruled out extra-mural contamination of the food-supply; absolved the kitchen staff from a causal standpoint; and constituted a tribute to the cleanly methods observed by the nursing staff within the wards. But although the preparation of meals was common to the whole institution, their distribution was effected in different ways by different people. Meals for patients were placed in food containers by the kitchen staff. The containers were taken to the wards by porters, and the meals distributed by nurses. The exempt engineers and porters distributed their own meals and consumed them apart. On the other hand, the food of all other sections of the staff was distributed to the various messes by maids who also set tables, served, and cleared up. These maids played no part in the service of the general wards. As already mentioned, 2 patients in the pay-block were infected, and it is significant that the patients in this block had the same breakfasts and dinners as their nurses; the medical and nursing staff the same meals at night; and the night nurses the same breakfasts and dinners as the day nurses.

These facts pointed to the probability of the infection of food supplied to these sections of the hospital population by dining-room maids. Nearly half this latter group were infected. It appears that the women-cleaners lunched at the same table but some hours earlier than the nurses' dining-room maids who however handled the same crockery, bread, &c., used by the earlier mess. Amongst the cleaners was a Mrs. B. who was employed in the laboratory. This woman went home ill shortly after her lunch at 9.30 A.M. on June 12th. On her return to the laboratory at the end of July her blood-serum agglutinated paratyphoid B very strongly. Dr. Pringle has no doubt that she suffered an attack of paratyphoid fever, although her stools, when it was possible to examine them, proved negative. A fellow worker of Mrs. B. in the laboratory, a boy, was proved to be excreting paratyphoid-B bacilli in his fæces on June 26th and as late as July 9th. Whether he himself suffered a clinical attack was not substantiated, but that as a carrier he infected his mother and brother between June 8th and 11th seems clear. Further, his professional duties included the decanting of acidophilous milk for an out-patient. Unfortunately, somewhere between June 10th and 12th he also decanted the organisms of paratyphoid with the result that the patient fell ill about June 17th. The source of infection of the two laboratory workers was not traced, but since a few cases of paratyphoid were notified in the town at the end of May and the beginning of June it may be hazarded that the receipt of some infected sample at the laboratory of a large general hospital was not impossible.

The moral of this outbreak has no doubt already been drawn by the hospital authorities themselves; it is unwise for laboratory cleaners to handle the food and utensils common to the mess unless they have first washed their hands, and for this, it seems, there were "no adequate arrangements."

No Death from Scarlet Fever

The week ending Sept. 21st, 1935, should not pass without comment for it was the first in the Registrar-General's records to show no death from scarlet fever registered in the great town aggregate for which the weekly reports are compiled. It is instructive to compare the number of deaths recorded in the great town aggregate for the three September weeks in the four decades of the present century,

Weekly Scarlet Fever Deaths

September	1905	1915	1925	1935
First week	32	17	5	2
Second week	39	14	3	2
Third week	40	18	9	0

and the fall in the totals is the more remarkable when it is remembered that the number of towns comprising the aggregate has increased from 76 in 1905 to 121 in 1935.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED SEPT. 21ST, 1935

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 2316; diphtheria, 1224; enteric fever, 73; acute pneumonia (primary or influenzal), 436; puerperal fever, 42; puerperal pyrexia, 126; cerebro-spinal fever, 17; acute poliomyelitis, 30; acute polio-encephalitis, 7; encephalitis lethargica, 6; typhus fever, 1 (Port of London), dysentery, 12; ophthalmia neonatorum, 76. No case of cholera or plague was notified during the week.

The number of cases in the infectious hospitals of the London County Council on Sept. 27th was 2679, which included: Scarlet fever, 876; diphtheria, 985; measles, 26; whooping-cough, 349; puerperal fever, 25 mothers (plus 8 babies); encephalitis lethargica, 270; poliomyelitis, 16. At St. Margaret's Hospital there were 14 babies (plus 3 mothers) with ophthalmia neonatorum.

Deaths.—In 121 great towns, including London, there was no death from small-pox or scarlet fever, 2 (1) from enteric fever, 5 (0) from measles, 16 (4) from whooping-cough, 22 (6) from diphtheria, 61 (9) from diarrhœa and enteritis under two years, and 19 (1) from influenza. The figures in parentheses are those for London itself.

It must be a long time since a week has gone by without the notification of a single death from scarlet fever. Deaths from diarrhœa and enteritis were distributed over 25 great towns, the highest being Liverpool 12, Nottingham 5, Gateshead 4, Hull, Manchester, and West Hartlepool each 3, no other great town more than 2.

The number of stillbirths notified during the week was 268 (corresponding to a rate of 42 per 1000 total births), including 38 in London.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—The following all-day courses will take place during October: cardiology, at the National Hospital for Diseases of the Heart (Oct. 7th to 18th); medicine and surgery and the specialties at the Metropolitan Hospital (Oct. 7th to 18th); gynæcology, at the Chelsea Hospital for Women (Oct. 21st to Nov. 2nd); neurology, at the West End Hospital for Nervous Diseases (Oct. 21st to 26th); chest Diseases, at Victoria Park Hospital (Oct. 28th to Nov. 2nd). Week-end courses will be held in heart and lung diseases at the Royal Chest Hospital (Oct. 12th and 13th); obstetrics at the City of London Maternity Hospital (Oct. 19th and 20th); physical medicine, at the St. John Clinic and Institute of Physical Medicine (Oct. 26th and 27th). Lectures on endocrinology will be given at the National Temperance Hospital, on Tuesdays and Thursdays at 8.30 P.M., from Oct. 8th to 24th; on modern gynæcology at the Medical Society of London, at 4 P.M. on Thursdays, from Oct. 10th to Nov. 7th; and on anatomy and physiology for the Primary F.R.C.S. at the Infants Hospital on Mondays, Wednesdays, and Fridays, at 8.30 P.M., from Oct. 7th to Nov. 29th. Courses arranged by the fellowship are open only to members. Further particulars may be had from the secretary of the Fellowship, 1, Wimpole-street, London, W.1.

MEDICAL NEWS

HOSPITAL DINNERS

St. Mary's Hospital

Mr. Duncan Fitzwilliams took the chair at the dinner at Claridge's last Saturday and found himself the toast of the evening. Dr. C. M. Wilson pointed out that whereas the tyro was apt on such occasions to make his subject sound indistinguishable from Lord Lister the expert proposer of toasts was recognisable by his ability to find chinks in the victim's armour. Mr. Fitzwilliams, however, must receive admiration for his courage in one thing at least—that he had been able to give up golf when he found he could not play it. His recreations were stated to be shooting and fishing, but what he really liked was playing at soldiers. We must enjoy this Elizabethan while we could; for already the tom-toms were beating in the bush and Dr. Wilson had a feeling that the streets of Addis Ababa would soon be seeing Fitzwilliams' car. He was a big man, immune from smallness, and his example showed how immeasurably a community gained by the presence of a personality. Replying, Mr. Fitzwilliams described Dr. Wilson as the local Mussolini, and said that if he had belonged to the League of Nations he would have offered parts of his colleagues in exchange for himself as chairman. Referring to exhibits in the lobby he reported that the hospital had won the inter-hospital rugby (and A cup), the cricket (and A cup), and many other trophies. It had lost the association football cup by one goal and the hockey cup to the winners; and it possessed in Lovelock probably the finest runner that this country had seen for generations. After speaking of the death of Prof. Collingwood, whose place has been taken by Prof. A. St. G. Huggett, he referred to the resignation of Dr. Wilfred Harris and Sir William Willcox. Dr. W. D. W. Brooks and Dr. D. H. Brinton had been appointed to the medical staff, and Mr. Fitzwilliams was able to illustrate their qualifications by quoting stories they had told him. He announced also that the staff had been so very prosperous of late that west-end consulting rooms could no longer contain their patients; but fortunately an anonymous donor had been persuaded to provide paying accommodation at the hospital. All this information was generously interlarded with irrelevancies, and the company dispersed in high good humour.

Middlesex Hospital

At the Savoy Hotel on Tuesday last an efficient installation of microphones made every speaker clearly audible to all the 363 diners. Dr. Campbell Thomson expressed his satisfaction at presiding in a year when the Middlesex Hospital celebrated its centenary and completed its rebuilding. In reviewing its new features, he spoke especially of the clinical unit, provided by Mr. S. A. Courtauld, where hospital and school can collaborate in the study of obscure diseases, and the X ray therapy and diagnosis departments, given and endowed by Mr. Meyerstein and Mr. Collins respectively. Mr. Meyerstein, one of the hospital's greatest benefactors, had that evening sent him a telegram offering £3000 to endow a second scholarship for University of London students. The medical school, said Dr. Thomson, had become a fitting partner for the splendid new hospital, and he mentioned that a ward had now been named after Mr. Webb-Johnson, treasurer of the school—a compliment never before paid to a member of the active staff. Mr. Courtauld and Dr. Boldero replied to the chairman's toast of the Hospital and School. Dr. Boldero, as dean, said that students of to-day behaved a great deal better than their predecessors: only two chairs had so far been broken in the new clinical theatre—one by a large visitor from America and one by a member of the Royal Family. They also showed much activity in the more important games: thus, four and often five rugger teams turned out on Saturdays, and the cricket team had not been beaten till the final. Dr. M. Hynes, as Broderip scholar, said that the teaching in preliminary sciences at Middlesex was the envy and admiration of students who came from places where these subjects were considered as ends in themselves rather than as the foundation of medicine. Mr. E. W. Riches wittily proposed The Guests, and Mr. H. L. Eason, vice-chancellor of London University, replied. For forty years, he said, there had been nothing approaching the developments carried through at the Middlesex Hospital during the last twelve years. He hoped the voluntary hospital system, with its freedom of action and scope for heterodoxy, would never die, but he saw risks in coöperation with such bodies as the London Council. ("I'm all in favour of coöperation," said the elephant, as it sat down on the pheasant's eggs with the laudable intention of keeping them warm.) What was really essential, however, was to keep the freedom and individuality of the teaching schools, and the public should learn that the teaching hospitals were those which must at all costs be supported.

In proposing the chairman's health, Mr. Webb-Johnson was in most amusing vein; but his tribute to Dr. Campbell Thomson was none the less impressive. No dean, he said, had ever entered so closely into the students' activities, and his service to the school before and during the late war was made possible only by surrender of all personal ambition in favour of the Middlesex Hospital and its greater good.

Westminster Hospital

Old students of Westminster Hospital medical school turned up in large numbers to their annual dinner on Sept. 28th, stimulated no doubt by interest in the plans for rebuilding hospital and school. Dr. Vivian Orr presided at the dinner, which was held at the Trocadero restaurant. Mr. E. Rock Carling, who proposed the toast of Hospital and Medical School, said they were at a critical period, with the centenary just over and the rebuilding ahead. Of the two classes of his hearers one would be glad to know that at the new hospital there would be a gymnasium and two squash courts; the other that the pathological department was to be adequate. He was glad to assure both that they were within reasonable sight of obtaining the money necessary for the new buildings. Dr. Arthur Davies, in responding, remarked that Westminster students always remained students, and that "Broadway," the hospital magazine, was an important link between old and new. Mr. J. O. Collin, secretary of the Students Clubs Union, responded on behalf of the school. Dr. Adolphe Abrahams, dean of the medical school, then proposed The Guests, with what he described as the correct proportion of eulogy and malice, although in regard to one guest he was fain to admit that he was really as nice as he looked. Sir James Hartigan, director-general, A.M.S., acknowledging the toast, said that the R.A.M.C. College would welcome the Westminster as near neighbour. He spoke of the need for strengthening the medical branches of the defence forces and of the confidence with which he would look to the Westminster school for support. Mr. W. R. Halliday, LL.D., principal of King's College, who also replied, gave an entertaining account of his practice as an unqualified doctor on an Ægean island during the late war, and went on to express anxiety at the overcrowding of the medical curriculum with specialties. The reports of sundry committees did not, he felt, go far enough in simplifying the curriculum. He was old-fashioned enough to believe that one had to learn in the preliminary stage the basic things and go on to other things afterwards if one had the time. Speaking of the relation between King's as a pre-medical and Westminster as a clinical school, he was not discouraged by the lapse of the legal connexion, feeling as he did that voluntary association was better. Finally, he regretted the forthcoming departure of Prof. D. M. Blair whose alma mater had claimed him. Mr. Arthur Evans, senior surgeon, proposed "The Chairman," which led to a graceful exchange of hospital lore.

Mr. Leslie Paton has been elected an honorary member of the Société belge d'Ophtalmologie.

University of London

Three lectures on the history of medicine will be delivered at University College hospital medical school by Prof. Charles Singer on Oct. 8th, 15th, and 22nd, at 5 P.M. The lectures are open to all medical students of the University.

University of Leeds

At recent examinations the following candidates were successful :—

M.D.

J. Fielding, G. D. Gordon, J. M. Holmes, J. Q. Mountain, and S. Silverman.

M.B., CH.B.

Part I.—Lily Black, Marie H. Calverley, C. L. Davidson, M. Glick, R. C. Lawrence, W. Maude, E. Moore, J. P. Senior, I. Smith, and P. H. Wyon.

Part II.—A. J. E. Barlow, E. Brown, T. K. Cooke, S. C. Crystal, C. V. Light, D. G. Liversedge, T. W. Percival, F. A. Shackleton, R. G. Smithson, Helene E. Sykes, and E. Vining.

Part III.—R. G. Smithson (with Second Class Honours), A. J. E. Barlow, E. Brown, T. K. Cooke, S. C. Crystal, C. V. Light, D. G. Liversedge, T. W. Percival, F. A. Shackleton, Helene E. Sykes, and E. Vining.

B.CH.D.

J. Mort, H. D. Whiteley, and T. J. Wood.

L.D.S.

J. E. Barthel, O. F. Brown, J. E. Hitchen, Lilla E. Rider, and Dorothy E. Smithson.

D.P.H.

Kathleen S. Bruce, C. G. Eastwood, E. R. Hargreaves, Lois J. Ogle, J. F. Warin, and Lydia A. Wilson.

The William Hey gold medal and the West Riding panel practitioners prize in medicine have been awarded to Edwin Howard Kitching.

University of Bristol

On Tuesday, Oct. 22nd, at 5.15 P.M., Dr. Macdonald Critchley will deliver the Long Fox lecture in the physiological theatre of this University. He will speak on the occurrence of pain.

University of Birmingham

A short post-graduate course will be held in connexion with the opening of the winter session on Oct. 11th and 12th. At 5 P.M. on Oct. 11th Sir Walter Langdon-Brown will present the prizes and give an address to the students in the medical theatre of the University. A reception by the dean and a dinner will be held at the Grand Hotel that evening at 7.45 P.M.

University of Aberdeen

Dr. Ernest Cruickshank, professor of physiology in Dalhousie University, Halifax, Nova Scotia, has been appointed regius professor of physiology in the University in succession to the late Prof. J. J. R. Macleod.

Ernest William Henderson Cruickshank was born in Edinburgh in 1888, and educated at Aberdeen, at Gordon's College, and later at the university whence he graduated M.B. in 1910. After holding the post of house physician at the Royal Infirmary he went to University College, London, with a Carnegie research fellowship, and remained there until 1915 when he served as a temporary captain in the R.A.M.C. with the 9th Scottish Division and 41st Battalion of the Machine Gun Corps. In 1919 he was appointed officer-in-charge of the Prisoners of War Repatriation Commission to the 3rd Bavarian Army Corps Area. In the same year he returned to take the higher degrees of D.Sc. Lond. and M.D. Aberd. His appointment to the post of instructor of physiology at the Washington School of Medicine, St. Louis, took him to America in 1920, and the next four years were spent as associate professor of physiology at the Pekin Union Medical College. In 1924 he returned to America for two years with a Rockefeller foundation travelling fellowship. In 1926 he took the Ph.D. Camb. and became M.R.C.P. Lond. He went to India as professor of physiology and biochemistry at the Prince of Wales Medical College, at Patna, and for a time he was also Sukhr Raj Ray reader in natural science at the University of Patna. In 1928, the year in which he took up his present chair, he published a book entitled the "Value of Scientific Thought in the Advancement of Modern Medicine." Prof. Cruickshank has also written text-books for students and contributed many articles to physiological journals. He was elected a fellow of the Royal Society of Edinburgh in 1929.

Infectious Diseases Hospital for North-East Lancashire

At a conference held at Accrington, which was attended by various representatives from neighbouring boroughs, it was decided that the erection of an infectious diseases hospital for North-East Lancashire was desirable. The annual cost of maintenance was estimated at about £8000 and the cost of building at between £600 and £800 per bed. It is proposed that there should be about 80 beds.

Post-Graduate Course at Leeds

A series of weekly lecture-demonstrations will be held at the General Infirmary on Tuesdays at 3.30 P.M. from Oct. 8th to Dec. 17th. Further particulars may be had from the honorary secretary of the post-graduate committee, the General Infirmary, Leeds.

Royal Free Hospital

A short post-graduate course for former students will be held at this hospital on Nov. 29th and 30th and Dec. 1st. Further particulars may be had from the secretary of the London School of Medicine for Women, Hunter-street, W.C.1.

Tuberculosis Clinic for East Ham

Mr. Arthur Greenwood recently opened a new clinic for the treatment of tuberculosis in the grounds of Durban House, Katherine-road, East Ham. The clinic has cost about £6000, and provides up-to-date facilities for treatment. It is erected on a site which it is hoped will become the public health centre of East Ham.

National Radium Commission

The new commission has been elected and consists of the following members: Lord Donoughmore (Chairman), * Sir Cuthbert Wallace, P.R.C.S. (Vice-Chairman), Dr. Thomas Carnwath (appointed by the Minister of Health), Dr. Thomas Ferguson (appointed by the Secretary of State for Scotland), * Dr. Rupert Hallam, Mr. G. W. C. Kaye, D.Sc. (Joint Hon. Secretary, appointed by the Department of Scientific and Industrial Research), Prof. J. C. G. Ledingham, F.R.S. (appointed by the Medical Research Council), * Mr. J. J. M. Shaw, F.R.C.S., * Mr. G. F. Stebbing, F.R.C.S. (Joint Hon. Secretary), * Prof. Beckwith Whitehouse, F.R.C.S., and * Prof. James Young, F.C.O.G. (* Appointed by The National Radium Trust.)

Association of Industrial Medical Officers

As a result of many months' negotiations, this Association came into being at a meeting at the London School of Hygiene on Sept. 27th, when 20 medical practitioners giving whole-time services to industrial firms in London and elsewhere decided to form it as the Association representative of their branch of practice. Their number will be augmented at an early date by the election to membership of many other whole- and part-time practitioners actively employed by industrial firms, all of whom are invited to apply for membership. The Association replaces, and continues the work of, the previous Council of Industrial Medicine which was formed ten years ago in the Federation of Medical and Allied Services. Its members continue also to constitute the advisory medical committee of the Industrial Welfare Society. The new Association will hold its meetings at the London School of Hygiene. There will be three each year in London and one in the provinces, and each meeting will be followed by a dinner in the School and a conference on the following day. The first chairman is Dr. N. Howard Mummery, of J. Lyons and Co., Ltd., and the hon. secretary is Dr. Donald Stewart, of Imperial Chemical Industries, Ltd., Birmingham. The objects of the Association are to provide the means whereby medical practitioners attached to industrial concerns can meet to discuss the many problems they meet with in their work, both in regard to preventive medicine and remedial surgery, and thus enhance their value to the management of their individual firms, promote the knowledge of their specialty, and increase their usefulness to industry as a whole. Although a good deal has already been done in these directions during recent years, it has been obvious that a more intensive study directed to reducing the vast amount of unnecessary industrial incapacity, and absenteeism, is needed. This the new Association has the means and the will to carry out. Already a good start has been made, for the first conference held on Sept. 28th a paper was read by Dr. Leonard Lockhart, of Messrs. Boots, Ltd., on the present position and future of industrial medicine, when a lively debate followed and particular attention was given to the relations of the members to private and panel practitioners and to hospitals and clinics in promoting the recovery of sick or injured employees.

Aberdeen New Maternity Hospital

The King has sent a donation of £30 to the building fund of the new maternity hospital at Aberdeen. The money was part of the proceeds for admission to Balmoral Castle grounds during the summer.

Cumberland Infirmary

The committee of management of this hospital have presented to the governors a scheme for the extension of the institution which allows for the erection of two new surgical wards, a new children's ward, a skeleton fourth ward, and a new operating theatre. Each of the new wards will accommodate 20 beds. A sum of £22,240 has been subscribed or promised for the extensions.

Grocers' Company Scholarships

An election for three of the scholarships which the Grocers' Company offers with the object of encouraging original medical research will take place in May, 1936. Each scholarship is worth £300 per annum, and an allowance is given for apparatus and other expenses in connexion with the work. The scholarships are tenable for one year but are renewable for a second or third year. Applications must be sent before the end of April to the clerk, Grocers' Hall, London, E.C.2.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.
TUESDAY, Oct. 8th.
Therapeutics and Pharmacology. 5 P.M. Dr. Dorothy C. Hare: Therapeutic Observations on Non-specific Colitis. (Presidential address.)
Psychiatry. 8.30 P.M.
Dr. H. J. Norman: Psychiatric Digressions. (Presidential address.)
FRIDAY.
Clinical. 5.30 P.M. (Cases at 4.30 P.M.) *Cases*: Mr. W. B. R. Monteith: 1. Bony Tumour of the Pelvis. Dr. F. Parkes Weber and Dr. A. Schlüter: 2. Local Fat-hyperplasia from repeated Insulin Injections. 3. Riedel's Lobe and Hepatoptosis. 4. Sequel to Removal of a Carcinomatous Lymph-gland. 5. Spondylose Rhizomélique (Marie) in a Young Man. Dr. Gerald Slot: 6–12. Cases illustrating Aurotherapy. Dr. C. E. Newman: 13. Hæmatoporphyrinuria and Hydroa Æstivale. Dr. Terence East: 14. Heart-block with Mitral Stenosis.
Ophthalmology. 8.30 P.M. (Cases at 8 P.M.) Mr. Cole Marshall: The Bipolar Electrolytic Treatment of Detachment of the Retina. Wing Commander P. C. Livingston: Modern Life and Binocular Vision.

PADDINGTON MEDICAL SOCIETY.
TUESDAY, Oct. 8th.—9 P.M. (Great Western Royal Hotel, W.), Dr. A. K. Gibson: Organisation of Medical Practice.

MEDICAL SOCIETY OF INDIVIDUAL PSYCHOLOGY.
THURSDAY, Oct. 10th.—8.45 P.M. (11, Chandos-street, W.), Dr. C. M. Bevan-Brown: Psychological Schools, a plea for correlation.

BIOCHEMICAL SOCIETY.
SATURDAY, Oct. 12th.—2.30 P.M. (Biochemical Laboratory, Cambridge), Short Communications.

SOCIETY FOR THE STUDY OF INEBRIETY.
TUESDAY, Oct. 8th.—4 P.M. (11, Chandos-street, W.), Dr. Gerald Slot: Medico-legal Aspects of Drunkenness.

LONDON JEWISH HOSPITAL MEDICAL SOCIETY, Stepney Green, E.
THURSDAY, Oct. 10th.—3.30 P.M., Sir Walter Langdon-Brown: Modern Aspects of Endocrinology.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.
THURSDAY, Oct. 10th.—5.30 P.M., Dr. W. B. Coley: Treatment of Inoperable Malignant Tumours with the Toxins of Erysipelas and *Bacillus prodigiosus*, based on a study of end-results from 1893 to 1934.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, Oct. 7th, to SUNDAY, Oct. 13th.—NATIONAL HOSPITAL FOR DISEASES OF THE HEART, Westmoreland-street, W. All-day course in cardiology.—METROPOLITAN HOSPITAL, Kingsland-road, E. All-day course in medicine, surgery, and the specialties.—NATIONAL TEMPERANCE HOSPITAL, Hampstead-road, N.W. Tues., 8.30 P.M., Dr. Levy Simpson: Pituitary and testis. Thurs., 8.30 P.M., Dr. Donald Hunter: Parathyroid.—MEDICAL SOCIETY OF LONDON, Chandos-street, W. Thurs., 4 P.M., Dr. V. B. Green-Armytage: Practical non-operative gynæcology.—ROYAL CHEST HOSPITAL, City-road, E.C. Week-end course in diseases of the heart and lungs.—Open only to members of the fellowship.

UNIVERSITY COLLEGE HOSPITAL, W.C.
THURSDAY, Oct. 10th.—10 A.M., Dr. W. N. Goldsmith: Acneiform Eruptions. 11 A.M., Mr. C. W. Flemming: Osteo-arthritis of the Hip-joint. 11.30 A.M., Miss Freda Kelly: Minnitt's Machine for Gas-air Analgesia in Labour. Noon, Prof. F. J. Browne: Placenta Prævia. 2 P.M., Sir Thomas Lewis: Symptoms of Gross Arterial Disease of the Limbs. 2 P.M., Dr. W. J. Pearson: Pulmonary Tuberculosis in Infants. 3 P.M., Dr. R. W. A. Salmond: The Diagnosis of Gastric, Duodenal and Appendix Lesions by X Rays. 4 P.M., Dr. F. M. R. Walshe: Poliomyelitis.
FRIDAY.—10 A.M., Dr. H. P. Himsworth: The Significance of Glycosuria. 11 A.M., Mr. Gwynne Williams: The Surgical Treatment of Arterial Disease in the Limbs. Noon, Dr. Kenneth Harris: Heart Attacks. 2 P.M., Mr. A. J. Gardham: Follow-up Cases Treated by Radium. 2 P.M., Dr. H. N. Webber: Closed Circuit Method of giving Gas and Oxygen. 2 P.M., Dr. E. A. Blake Pritchard and Dr. L. P. E. Laurent: Cases of Myasthenia Gravis under Treatment with Prostigmin 3 P.M., Dr. D'Arcy Hart: Lipiodol Injection for the Diagnosis of Bronchiectasis. 3 P.M., Mr. Julian Taylor: Obstruction of the Common Bile-duct. (Open only to former students of the hospital.)

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
THURSDAY, Oct. 10th.—2 P.M., Dr. Brain: Principles of Treatment of Skin Diseases in Children. 3 P.M., Dr. Payne: Diabetes in Children (Part I.).
Out-patient clinics daily at 10 A.M. and ward visits (except on Wednesday) at 2 P.M.

KING'S COLLEGE HOSPITAL, Denmark-hill, S.E.
THURSDAY, Oct. 10th.—9 P.M., Dr. Wilfrid Sheldon: Tuberculosis in Children.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C.
FRIDAY, Oct. 11th.—4 P.M., Mr. A. Brown Kelly: Œsophagus in Young Children: some anatomical and clinical observations (annual address).

NATIONAL HOSPITAL, Queen-square, W.C.
MONDAY, Oct. 7th.—3.30 P.M., Dr. Kinnier Wilson: Aphasia Apraxia.
TUESDAY, 3.30 P.M., Dr. Purdon Martin: The Cranial Nerves (1).
WEDNESDAY.—3.30 P.M., Dr. Kinnier Wilson: Clinical Demonstration.
THURSDAY.—3.30 P.M., Dr. Riddoch: The Sensory System (1).
FRIDAY.—3.30 P.M., Dr. Bernard Hart: The Psychoneuroses (1).
Out-patient clinic daily at 2 P.M.

LONDON SCHOOL OF DERMATOLOGY, 49, Leicester-square, W.C.
TUESDAY, Oct. 8th.—5 P.M., Dr. M. Sydney Thomson: Animal Diseases Communicable to Man.
WEDNESDAY.—5 P.M., Dr. I. Muende: Introduction to Histopathology of the Skin.
Thursday.—5 P.M., Dr. J. M. H. MacLeod: Ringworm Infections.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.
MONDAY, Oct. 7th.—10.30 A.M., Medical Wards, Skin Clinic. 11 A.M., Surgical Wards. 2 P.M., Gynæcological and Surgical Wards, Eye and Gynæcological Clinics.
TUESDAY.—10 A.M., Medical Wards. 11 A.M., Surgical Wards. 2 P.M., Throat Clinic.
WEDNESDAY.—10.30 A.M., Children's Wards and Clinic, Medical Wards. 2 P.M., Eye Clinic, Gynæcological Operations. 4.15 P.M., Mr. Harvey Jackson: Surgical Methods in Localisation of Brain Tumours.
THURSDAY.—10 A.M., Neurological and Gynæcological Clinics. Noon, Fracture Clinic. 2 P.M., Eye and Genito-urinary Clinics.
FRIDAY.—10 A.M., Skin and Dental Clinics. Noon, Lecture on Treatment. 2 P.M., Throat Clinic. 4.15 P.M., Dr. Konstam: Cardiac Pain.
SATURDAY.—10 A.M., Children's and Surgical Clinics, Medical Wards.
The lectures at 4.45 P.M. are open to all Medical Practitioners without fee. Operations and medical and surgical clinics, daily at 2 P.M.

UNIVERSITY OF LONDON.
TUESDAY, Oct. 8th.—5 P.M. (University College Hospital Medical School), Prof. Charles Singer: Some Medical Books of Historical and Artistic Interest.

PUBLIC DISPENSARY AND HOSPITAL, Leeds.
WEDNESDAY, Oct. 9th.—4 P.M., Mr. L. N. Pyrah: Septic Infections of the Hand.

GENERAL INFIRMARY, Leeds.
TUESDAY, Oct. 8th.—3.30 P.M., Dr. Watson: Cases exhibiting variation in blood pressure.

ROYAL INFIRMARY, Manchester.
TUESDAY, Oct. 8th.—4.15 P.M., Dr. D. Dougal: Dysfunctional Uterine Hæmorrhage.
FRIDAY.—4.15 P.M., Dr. F. E. Tylecote: Demonstration of Medical Cases.

Appointments

ALLAN, S. M., M.D. Glasg., D.P.M., has been appointed First Senior Assistant Medical Officer at the Mental Hospital, Whittingham.

BONNELL, H. E., B.Sc. Wales, M.R.C.S. Eng., part-time Pathologist to the East Ham Memorial Hospital.

FLEMING, J. A. C., M.B., F.R.C.S. Edin., D.R., Assistant Radiologist to the Cancer Hospital (Free), London.

FLOOD, P. A., M.R.C.S. Eng., D.M.R., Assistant Radiologist to the Cancer Hospital (Free), London.

GILMOUR, MARY D., M.B. Glasg., Pathologist at the Marie Curie Hospital, London.

TURNER, M.D. Lond., D.P.H., Senior Medical Officer (Education) for Leicester.

Certifying Surgeon under the Factory and Workshop Acts: Dr. B. J. SIM (Wigston District, Leicester).

Vacancies

For further information refer to the advertisement columns

Ashton-under-Lyne, District Infirmary.—Two H.S.'s. At rate of £150.

Aylesbury, Royal Buckinghamshire Hospital.—Second Res. M.O. At rate of £150.

Beckenham, Bethlem Hospital, Monk's Orchard.—Res. H.P. At rate of £150.

Belgrave Hospital for Children, Clapham-road, S.W.—Two H.P.'s. and H.S. Each at rate of £100. Also Hon. Radiologist.

Birmingham General Hospital.—Med. Reg. and Res. M.O. £155.

Blackburn, Queen's Park Hospital and Institution.—Res. Jun. Asst. M.O. £150–£200.

Brighton, Royal Alexandra Hospital for Sick Children.—H.S. £120.

Burnley, Victoria Hospital.—H.P. At rate of £150.

Buxton Clinic for Rheumatism and Allied Diseases.—H.P. At rate of £150.

Cambridge, Addenbrooke's Hospital.—H.P. At rate of £130.

Cambridgeshire C.C.—Asst. County M.O. £600.

Cancer Hospital, Fulham-road, S.W.—Surgical Registrar.

Central London Throat, Nose, and Ear Hospital, Gray's Inn-road, W.C.—Third Res. H.S. At rate of £75.

Central Middlesex County Hospital.—Med. Supt. £1300.

Chaily, Sussex. Heritage Orthopædic Hospitals.—R.M.O. £345.

Connaught Hospital, Walthamstow, E.—Cas. O. At rate of £100.

Dewsbury and District General Infirmary.—Second H.S. £150.

East Ham County Borough.—Asst. M.O.H. £500.

Exeter, Royal Devon and Exeter Hospital.—H.S. At rate of £150.

Folkestone, Royal Victoria Hospital.—Hon. Asst. Ophth. Surgeon.

Goldie Leigh Hospital, Abbey Wood, S.E.—Consulting Physician. £450.

Great Yarmouth General Hospital.—H.S. £140.

Hospital for Epilepsy and Paralysis, Maida Vale, W.—Res. M.O. Also H.P. At rate of £150 and £100 respectively.

Hove General Hospital.—Res. M.O. At rate of £150.

Infants Hospital, Vincent-square, Westminster.—H.P. At rate of £75. Also Hon. Dental Surgeon.

Ipswich, East Suffolk and Ipswich Hospital.—Res. Surg. Officer. £400.

Ipswich Mental Hospital.—H.P. At rate of £150.

Isleworth, West Middlesex County Hospital.—Asst. M.O.'s. Each £400.

Jersey General Hospital and Poor Law Infirmary.—Asst. Res. M.O. At rate of £150.

Kidderminster and District General Hospital.—H.S. £150.

Kingston-upon-Hull City and County.—Asst. M.O.H. £600.

Lambeth Hospital, Brook-street, S.E.—Pathologist. £1100–£50–£1300.

Lancaster, County Mental Hospital.—Temp. Asst. M.O. 7 guineas per week.

Leeds City.—Asst. Clin. Tuber. O. £500.

L.C.C. Special Hospitals Service.—Sen. Asst. M.O.'s. Each £500. Asst. M.O.'s. Each £350. Also Asst. M.O.'s. £250.

Leamington Spa, Warneford General Hospital.—Res. H.P. At rate of £150.

London Hospital Medical College, E.—Hutchinson Triennial Prize, 1938.

London Lock Hospital, 283, Harrow-road, W.—Surg. Reg. for Dean-street Hospital. £100.

Macclesfield General Infirmary.—Sen. H.S. £180.

Manchester, Crumpsall Hospital and Institution.—Jun. Asst. M.O. At rate of £200.

Manchester, Monsall Hospital for Infectious Diseases.—Jun. Res. Asst. M.O. At rate of £250.

Manchester Royal Children's Hospital, Pendlebury.—Res. Surg. O. At rate of £125.

National Temperance Hospital, Hampstead-road, N.W.—H.P. At rate of £100.

Newport, Mon., Royal Gwent Hospital.—Jun. Res. M.O. At rate of £135.

Northampton General Hospital.—H.S. to Ear, Nose, and Throat Dept. At rate of £150.

North-Western Hospital, Lawn-road, Hampstead, N.W.—Pathologist. £1100–£50–£1300.

Norwich, Norfolk and Norwich Hospital.—H.S. to Spec. Depts. Also Cas. O. Each at rate of £120.

Nottingham General Hospital.—H.S. for Ear, Nose, and Throat Dept. At rate of £150.

Plymouth Mental Hospital, Blackadon, Ivybridge.—Asst. M.O. £350.

Plymouth, Prince of Wales's Hospital, Greenbank-road.—Res. Anæsthetist and H.S. to Spec. Depts. At rate of £120.

Queen's Hospital for Children, Hackney-road, E.—Asst. Physician.

Richmond Royal Hospital.—Jun. H.S. At rate of £100.

Rochester, St. Bartholomew's Hospital.—H.P. At rate of £175.

Romford, Oldchurch Hospital.—Jun. Res. M.O. £250.

Royal National Orthopædic Hospital, Great Portland-st., W.—Two Registrars. Each £105.

Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—H.P. At rate of £100.

St. Bartholomew's Hospital, E.C.—Asst. Neurologist.

St. John's Hospital, Lewisham, S.E.—Res. H.P., Res. H.S. Also Res. Cas. O. Each at rate of £100.

St. Margaret's Hospital, Leighton-road, Kentish Town, N.W.—Visiting M.O. £200.

Salisbury, General Infirmary.—Res. M.O. £250.

Salop County Council.—Assist. M.O. £500.

Shrewsbury Royal Salop Infirmary.—Res. Surg. O. £250. Also Res. H.S. and Res. H.P. Each at rate of £160.

Southend-on-Sea General Hospital.—Hon. Visiting General Physician and Surgeon.

South London Hospital for Women, Clapham Common, S.W.—Asst. Radiologist. £200. Also Med. Reg. £50.

Stoke-on-Trent, North Staffordshire Royal Infirmary.—H.P. At rate of £150.

Stoke-on-Trent, Stanfield Sanatorium.—Res. M.O. £250.

Sunderland Children's Hospital.—H.P. £120.

Surrey County Council.—Jun. Asst. M.O. for County Sanatorium. At rate of £250.

Sutton, Surrey, Downs Hospital for Children.—Asst. M.O. £350.

Swanley Hospital Convalescent Home, Parkwood.—Res. M.O. At rate of £200.

Tilbury Hospital.—Med. Supt. £200.

Victoria Hospital for Children, Tite-street, Chelsea, S.W.—Sen. Res. M.O. £200. Also Cas. Sorting O. At rate of £200.

West End Hospital for Nervous Diseases, 73, Welbeck-street, W.—Hon. Clin. Psychologist.

Western Ophthalmic Hospital, Marylebone-road, N.W.—Sen. and Jun. Res. H.S.'s. At rate of £150 and £100 respectively.

Westminster Hospital Annexe, 66, Fitzjohn's-avenue, Hampstead.—Res. M.O. £200.

Weston-super-Mare General Hospital.—Res. H.P. £150.

Willesden General Hospital, Harlesden-road, N.W.—Physio-Therapeutist. £75. Also Hon. Physician.

Wolverhampton Royal Hospital.—H.S. At rate of £100.

York County Hospital.—H.S. to Eye, Ear, Nose, and Throat Dept. £150.

York Dispensary.—Res. M.O. £175.

Yorkshire Children's Orthopædic Hospital, Kirbymoorside.—H.S. At rate of £150.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Rhondda (Treorchy) (Glamorgan), Aberchirder (Banff), and Leiston (Suffolk).

Births, Marriages, and Deaths

BIRTHS

BOGGON.—On Sept. 26th, at Welbeck-street, the wife of R. H. Boggon, M.S. Lond., of a son.

CRAWFORD.—On Sept. 17th, at Southsea, the wife of Surg. Lt.-Comdr. T. G. B. Crawford, R.N., of a daughter.

DARMADY.—On Sept. 28th, at Devonshire-place, W.1, the wife of E. M. Darmady, M.R.C.S. Eng., of a daughter.

EVANS.—On Sept. 24th, at Devonshire-place, W.1, the wife of Horace Evans, M.D. Lond., of a daughter.

GREEN.—On Sept. 20th, at Sevenoaks, the wife of Ralph Green, M.R.C.S. Eng., of Borough Green, Kent, of a son.

HARRIS.—On Sept. 22nd, at Chelmsford, the wife of H. A. H. Harris, F.R.C.S. Edin., of a daughter.

LEHMANN.—On Sept. 24th, at Wickham Market, Suffolk, the wife of Harold Paul Lehmann, M.R.C.S. Eng., of a son.

LLOYD.—On Sept. 23rd, at Aldeburgh, the wife of W. Jeaffreson Lloyd, M.B. Camb., of a daughter.

MORRISON.—On Sept. 21st, at Llanelly, the wife of W. J. Morrison, M.B. Belf., of a son.

MARRIAGES

HARGREAVES—PURSER.—On Sept. 26th, quietly, at Hubberholme Church, Yorkshire, Edward Rhodes Hargreaves, M.B. Camb., D.P.H., to Hilda Nancy, only daughter of Colonel L. M. Purser, D.S.O., M.B.

DEATHS

ALLEN.—On Sept. 24th, at Ealing, William Hamilton Allen, M.D. Dub., late of Stanmore, Middlesex.

CHAMBERS.—On Sept. 22nd, suddenly, at Harrogate, Surgeon-Vice-Admiral Sir Joseph Chambers, K.C.B., C.M.G., K.H.P., retired, aged 70 years.

JONES.—Edwin Evanson, Wellington Villa, 1455, Ashton Old-road, Manchester, 11, L.R.C.P. Ed. & L.M., L.R.C.S. Ed., L.R.F.P.S. Glas., 1887, Mem. B.M.A., late Res. Med. Off. Chorlton Union Hosps., Hon. Surgeon Chorlton-upon-Medlock Disp., son of the late Dr. and Mrs. Edwin Jones, of Rhyl.

LEE BOLTON.—On Sept. 24th, R. Lee Bolton, L.R.C.P. Edin., of Fetcham, Leatherhead, late of Leeds.

PEDLEY.—On Sept. 21st, at Peacehaven, Sussex, Samuel Edward Pedley, M.R.C.S., L.D.S. Eng., of Welbeck-street, W., in his 73rd year.

PHILLIPS.—On Sept. 21st, at Llandilo, David Phillips, M.R.C.S. Eng.

SHRUBSALL.—On Sept. 25th, suddenly, at Hampstead, Frank Charles Shrubsall, M.D. Camb., F.R.C.P. Lond.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.